

## PART 1 - GENERAL

### 1.1 SCOPE OF WORK

- .1 The facility at which this contract is to be completed is the Agriculture & Agri-Food Canada, Canada – Saskatchewan Irrigation Diversification Centre in Outlook, Saskatchewan.
- .2 The AAFC's Site Representative shall be the Contractor's on-site contact person. All communication to be made via the AAFC Site Representative:
  - .1 Barry Vestre - Field Operations Supervisor  
PO BOX 700, 901 McKenzie Street South  
Outlook, Saskatchewan S0L 2N0  
Telephone : 306-867-5413  
E-mail : [Barry.Vestre@AGR.GC.CA](mailto:Barry.Vestre@AGR.GC.CA)
- .3 All works must be installed according to the National and Provincial Plumbing Codes, Electrical Codes, Building Codes, National Fire Code and local by-laws.
- .4 Contractor shall provide all labour, materials, equipment and site supervision necessary for and/or incidental to the completion of this contract and as indicated on the drawings. The Work shall include, but not be limited to the following:
  - .1 Interruption of the potable water supply, coordinated with the AAFC Site Representative, which may be outside of regular business hours.
  - .2 Installation of booster pump, pressure tank, and associated plumbing works.
    - .1 Commission of the water system to ensure the system is operational and to the satisfaction of the AAFC Site Representative.

### 1.2 DRAWINGS

- .1 The following drawings are to be read with the contract specification documents:
  - .1 DWS-1 – Site Location
  - .2 DWS-2 – Administrative Building #1
  - .3 DWS-3 – Chemical Storage Building
  - .4 DWS-4 – Equipment Repair Shop
  - .5 DWS-5 – Greenhouse Building
  - .6 DWS-6 – Vegetable Research Building (Main Floor)
  - .7 DWS-7 - Vegetable Research Building (Mezzanine)
  - .8 MP-1 – Administrative Building #1 – Backflow Prevention Schematic Recommendation
  - .9 MP-2 – Chemical Storage Building – Backflow Prevention Schematic Recommendation
  - .10 MP-3 – Equipment Repair Shop – Backflow Prevention Schematic Recommendation
  - .11 MP-4 – Greenhouse Header House Building – Backflow Prevention

Schematic Recommendation  
.12 MP-5 – Vegetable Research Building – Backflow Prevention  
Schematic Recommendation

- .2 The drawings show approximate dimensions and general arrangement of the work to serve as a guide for the Contractor to establish the bid offered in the tender.
- .3 The Contractor shall anticipate variations from the drawing details and make such cost allowances as deemed necessary for contract completion without extras.

### 1.3 BID PREPARATION

- .1 Prior to submitting the tender, the Contractor shall examine the job site, construction and storage areas, compare contract drawings and specifications with existing conditions, and fully satisfy as to all data and matters required for the completion of the contract.
- .2 Failure of the Contractor to acquaint fully with all available information concerning conditions affecting the work shall not relieve the Contractor of the responsibility for estimating the difficulties and costs of satisfactorily performing the work.
- .3 The tender documents shall be read and examined by all sub-trades to acquaint them with the full nature of the required work. Failure to do so will not relieve the Contractor of the responsibility for completing the work, nor for co-ordination of the work, prevention of delay or supply of labour, materials and equipment, etc., necessary for the proper execution of the contract at no additional cost.

### 1.4 PAYMENT

- .1 Payment for the work completed as per the contract documents shall be a LUMP SUM. The lump sum bid shall include the cost of all labour, plant and materials, and mobilization and demobilization including all applicable taxes, for all of Work.
- .2 No separate payment will be made for the work specified in the contract documents; Payment for work classified and approved by the AAFC Site Representative as Additional Work and Materials.

### 1.5 SPECIAL INSTRUCTIONS

- .1 Contractor will be required to attend a meeting with the AAFC Site Representative before work is scheduled to start.
- .2 Contractor shall prevent contamination of the potable water system during the installation and testing of all materials as part of this contract.
- .3 Contractor will be allowed to use existing water, electricity and other utility services required for the construction and maintenance of the works, subject to approval of the AAFC Site Representative.
- .4 All removed material and devices not required for further use, at the AAFC Site Representative's discretion, shall become the property of the Contractor.

- .5 Contractor shall provide a warranty for all work and materials for one year upon construction completion date.

## 1.6 SITE PROVISIONS

- .1 AAFC will furnish to the Contractor, without charge, all site areas within the boundaries of the land owned or controlled by AAFC which, in the opinion of the AAFC Site Representative, are necessary for the performance of the work.
- .2 There will be AAFC employees, and may be other contractors or agencies working on the site and in the area of this contract. The Contractor shall co-ordinate activities with others in the working areas so that the work of all concerned shall proceed with efficiency and dispatch. No claim for additional payment will be considered on account of delays, changes in construction schedules, or any other reason whatsoever, due to the fact that others are operating in the area.
- .3 The Owner may impose limits on working hours or noisy work activities. When work is carried out at night, the Contractor shall supply, at own cost, a sufficient number of electric or other approved lights to enable the work to be done in an efficient and satisfactory manner. No work shall be done if, in the opinion of the AAFC Site Representative, there is insufficient light to perform the work safely and satisfactorily.

## 1.7 CONSTRUCTION PROGRAM

- .1 The capacity of the Contractor's construction equipment, sequence of operations, and methods of operation shall be such as to ensure the completion of the work by DATE.
- .2 Within seven calendar days after the Contractor has been advised in writing of the acceptance of the tender, the Contractor shall provide the AAFC Site Representative with the proposed program of operations.
- .3 Contractor, in preparation of the construction program, shall be aware of, and embody therein, site requirements, all order of work requirements set out in the specifications and on the drawings.

## 1.8 MATERIALS

- .1 The Contractor shall be required to furnish all materials and supplies necessary for the satisfactory completion of the contract, except such items that are expressly specified to the contrary.
- .2 Materials used in the work shall meet the requirements of the specifications, or where not detailed in the specifications, shall be to the AAFC Site Representative's satisfaction.
- .3 Contractor shall notify the AAFC Site Representative of the suppliers who are proposed to supply the material; All materials shall be new unless otherwise specified.
- .4 All materials and equipment supplied shall be in accordance to all applicable and current editions of Municipal, Provincial and Government of Canada codes and regulations.

- .5 All materials provided by the Contractor shall vest in and become the property of AAFC once delivered to the site of the works, but shall remain in the custody and at the risk of the Contractor. AAFC assumes no responsibility for loss or damage to materials or equipment for any reason.
- .6 The costs of hauling, storing, processing, handling and caring for all materials and supplies furnished by the Contractor shall be included in the tender price.
- .7 The responsibility as to which sub-trade provides required articles, services and materials to be built in or provided, rests solely with the Contractor. Extras will not be considered based on grounds of difference in interpretation of the specifications as to which trade involved will provide certain materials or services, in order that the end product conform to the intent of the contract.
- .8 In order to establish standards of quality, some of the products are referred to by name. This procedure is not to be construed as eliminating from competition other products of equal or better quality.
- .9 Requests for Approved Equals shall be made in writing, at least seven working days prior to the time of tender closing.
  - .1 Each application for approval shall fully describe the proposed alternative and be complete with copies of full and complete technical data such as catalogue sheets, illustrations, etc. and all other information required by the AAFC Site Representative to evaluate the proposed alternatives.
  - .2 Submissions solely referenced to catalogues will not be considered.
  - .3 Where the Approved Equal requires correction, modifications or alternative installation in addition to those required by the specified products, include details thereof.
  - .4 The AAFC Site Representative will advise in writing of the acceptability of the proposed alternative prior to tender closing.

## 1.9 EQUIPMENT & MATERIALS STORAGE

- .1 Contractor shall be permitted to use only those areas which have been designated by the AAFC Site Representative for storage and construction areas 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.
- .2 Contractor shall confine equipment, materials and operations to limits indicated by law, ordinances, permits or directions of the AAFC Site Representative and shall not unreasonably encumber the work area with his materials.
- .3 Contractor shall be responsible for the protection of all material, equipment and constructed works until acceptance of the work.

- .4 It is not intended that the assignment of certain equipment and construction areas shall imply that others may not have access to or perform other work in the designated 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 AAFC Site Representative to the minimum considered consistent with efficient prosecution of the work under this and other contracts in force.
- .5 In the event the Contractor finds it necessary to utilize additional area for the performance of the contract, which is not owned or controlled by AAFC, the Contractor shall make all necessary arrangements for the utilization of the required area at no expense to AAFC.
- .6 AAFC Site Representative shall be the sole judge in all matters of access and area utilization by the Contractor and others. In accordance with the provisions of Section 1.13, the Contractor shall assume full responsibility for the direction of the on-site safety for all those required to enter the construction site for the duration of this Contract.
- .7 If private land is used by the Contractor, all necessary arrangements shall be made with the owner of the private land, and shall pay for rentals and other costs connected therein.

#### **1.10 LINES AND GRADES**

- .1 Contractor shall control and construct the work in accordance with the lines and slopes shown on the drawings or as modified by the AAFC Site Representative. Contractor shall be responsible for proper alignment, height, and depths of all works embodied in the contract.
- .2 Contractor shall establish bench marks and reference points or base lines to be used as a datum for all elevations and as a reference for the location of the works; Contractor shall exercise care in the preservation of bench marks, reference points or base lines set for his use. Contractor shall pay for re-establishment if they are displaced or removed.
- .3 If, in the opinion of the AAFC Site Representative, the Contractor's method of setting lines and grades is inaccurate or insufficient, the AAFC Site Representative will direct that more suitable methods be used to ensure that proper lines and slopes are maintained.

#### **1.11 INSPECTION & TESTS OF WORKS**

- .1 All materials furnished and all work performed will be subject to inspection.
  - .1 Inspections will be performed by AAFC Site Representative and the cost of inspection and testing will be borne by AAFC, except where this contract specifies otherwise.
  - .2 Contractor to provide access to all portions of work and co-operate with AAFC Site Representative.
- .2 If defects are revealed during the construction, the AAFC Site Representative will request additional inspection and cut tests to ascertain full degree of defects, all at Contractor's expense.

- .3 Corrections of defects or irregularities, as directed by the AAFC Site Representative, will be subject to further inspection. All costs for required re-inspection and additional engineering time after initial inspection, and for related work, will be borne by the Contractor.
- .4 Contractor must demonstrate to the AAFC Site Representative that all components are suitable and satisfactory for their intended purpose and that they meet all the applicable requirements of the National Building Code of Canada.
- .5 Samples may be taken for testing purposes by the AAFC Site Representative at frequent intervals. The results of such tests will be used to make adjustments to defects, errors, and omissions, and if adjustments are unsuccessful or not feasible, then any replacements necessary to restore satisfactory operation shall be made by the Contractor.
- .6 If the Contractor covers or permits work to be covered, any work that is subject to inspection or testing, without the approval of the AAFC Site Representative, the Contractor shall uncover the work at own expense, so that the inspection or tests satisfactorily may be completed and approved.

#### **1.12 PERMITS, LICENSES, REGULATIONS AND ACTS**

- .1 Contractor shall be responsible for obtaining and paying for any permits or licenses that are required for completion of the Contract.
- .2 Contractor shall be in accordance to all applicable and current editions of Municipal, Provincial and Government of Canada codes and regulations.
- .3 Contractor shall comply with all Workers Compensation Board regulations as they apply to the work of this contract.

#### **1.13 HEALTH & SAFETY**

- .1 Contractor shall use due care and take all necessary precautions to ensure the protection of persons and property and shall comply with the provision of the applicable Provincial and Government of Canada agencies including, but not limited to:
  - .1 Work Safe Saskatchewan
  - .2 Workers' Compensation Board - Saskatchewan
- .2 All training and safety equipment acquisition, transportation and maintenance is the responsibility of the Contractor.
- .3 Contractor shall have a site safety management plan against accident and injury prior to mobilizing to site.
  - .1 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 and contractors who may require access to the site.
  - .2 Contractor shall post all necessary and applicable signs regarding safety hazards and the required personal safety equipment within construction site.

- .3 Contractor shall appoint a competent site supervisor who shall be responsible for all daily construction activities with authority over all contractors, sub-contractors, and workers on site, including the implementation of the site safety management plan.
- .4 Contractor shall, without additional instructions, supply and maintain at all times during the progress or suspension of the work, suitable fall-arrest devices, barricades, fences and signs as necessary 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.
- .5 Notwithstanding the provisions of the General Instructions, in any emergency affecting the safety of life, or of the work, or of adjoining property, the Contractor, without direction from the AAFC Site Representative, shall act in a reasonable manner to prevent loss or injury.
- .6 Contractor shall confine equipment, materials and operations to limits indicated by law, ordinances, permits or directions of the AAFC Site Representative and shall not unreasonably encumber the work area with his materials.
- .7 Contractor shall comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada and Health and Welfare Canada; deliver copies of WHMIS data sheets to Owner on delivery of materials.
- .8 Prior to AAFC awarding a contract, the proposed staff of the successful contractor and subcontractor(s) must be security cleared to a "Reliability" security classification level. Each of the proposed staff must complete "Security Clearance Form" (TBS 330-23E). These forms are available from AAFC, upon request.

#### 1.14 FIRE PROTECTION

- .1 Provide and maintain adequate temporary fire protection equipment during performance of work, as required by insurance companies having jurisdiction, Municipal, Provincial and Government of Canada codes and regulations having jurisdiction.
- .2 Handle gasoline and like combustible materials with good, safe practices; Remove combustible debris from site daily.

**END OF SECTION**

**Part 1 GENERAL**

**1.1 GENERAL**

- .1 This section specifies general requirements and procedures for contractor's submissions of shop drawings, product data, samples and mock-ups to the AAFC Site Representative to distribute for review as required.
- .2 Contractor shall not proceed with Work until relevant submissions are reviewed and approved by the AAFC Site Representative and other applicable parties.
- .3 Present shop drawings, product data, and samples in Imperial and Metric units; Where items or information is not produced in Metric units converted values are acceptable.
- .4 Contractor shall notify the AAFC Site Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .5 Contractor shall be responsible for errors and omissions in submissions which is not relieved by the AAFC Site Representative's review of submissions.
- .6 Contractor's responsibility for deviations in submissions from requirements of Contract Documents is not relieved by the AAFC Site Representative review of submission, unless written acceptance of specific deviations is provided.
- .7 Contractor to make any changes to submissions which the AAFC Site Representative may request, consistent with Contract Documents' requirements, and resubmit as directed by the AAFC Site Representative.
- .8 Contractor to notify the AAFC Site Representative, in writing, when resubmitting or providing any revisions other than those requested by the AAFC Site Representative.
- .9 Where AAFC Site Representative is required to review information, method samples, mock-ups and completed corrections more than once and/or enter into extended discussions or preparation of additional details to facilitate the Contractor's work or that of his sub-trades, the additional consultant's time shall be paid for by the Contractor.
- .10 If deficient workmanship or construction requires additional or unscheduled site visits by the AAFC Site Representative, or other applicable parties, the additional time and disbursements based on the consultant's hourly rates, etc. shall be paid by the Contractor.

**1.2 SUBMISSION REQUIREMENTS**

- .1 Contractor to coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .2 Allow **6 to 10 days** for the AAFC Site Representative to review each submission.
- .3 Accompany submissions with transmittal letter, in duplicate, containing:



- .1 Date.
- .2 Project title and number.
- .3 Contractor's name, address, phone and fax number, and email address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.
- .4 Submissions shall include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Contractor.
    - .2 Subcontractor.
    - .3 Supplier.
    - .4 Manufacturer.
    - .5 Contractor's stamp, signed by Contractors authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents shall be completed prior to submission to the AAFC Site Representative. AAFC will take no responsible for dimensions or related data and affects.
- .5 Detail appropriate portions of Work as applicable, including but not limited to:
  - .1 Fabrication
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Materials.
  - .7 Standards.
  - .8 Operating weight.
  - .9 Wiring diagrams.
  - .10 Relationship to adjacent work.
- .6 After AAFC Site Representative's review and approval, distribute copies.

### 1.3 SHOP DRAWINGS

- .1 Contractor shall submit three complete set of shop drawings within 14 days after notification of the award of the contract.
- .2 Shop drawings shall be original drawings, or modified standard drawings provided by Contractor, to illustrate details of portions of Work, which are specific to project requirements.
- .3 Contractor shall cross-reference shop drawing information to applicable portions of Contract Documents as applicable.

- .4 Shop drawings will be reviewed by AAFC Site Representative and one (1) copy will be stamped **Reviewed** and returned to the Contractor. Contractor shall carry out construction in strict accordance therewith and shall make no further changes therein except upon written instruction from the AAFC Site Representative.
- .5 The shop drawing review shall not, in any case, relieve the Contractor from the responsibility for errors that may exist in shop drawings or from completing the work in accordance with the contract documents.
- .6 Any Work undertaken before shop drawings are returned as **Reviewed** will be at the Contractor's risk and expense.
- .7 The review of shop drawings by the AAFC Site Representative is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that the AAFC Site Representative approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents. Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades.

#### 1.4 PRODUCT DATA

- .1 Contractor shall submit three copies of product data as required.
- .2 Product data shall be manufacturer's catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
- .3 Contractor to delete information not applicable to Work prior to submission.
- .4 Supplement standard information to provide details applicable to project.
- .5 Cross-reference product data information to applicable portions of Contract Documents.

#### 1.5 SAMPLES

- .1 Samples shall be examples of materials, equipment, quality, finishes, workmanship.
- .2 Where colour, pattern or texture is criterion, submit full range of samples to AAFC Site Representative.
- .3 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified. Note: this requirement is mandatory.

#### 1.6 OPERATIONS AND MAINTENANCE MANUAL

- .1 Assemble, coordinate, bind and index required data into Operation and Maintenance Manual.
- .2 Submit complete operation and maintenance manual to AAFC Site Representative six weeks prior to application for Certificate of Completion of project.

- .3 Submit five copies in English.
- .4 Organize data into same numerical order as contract specifications.
- .5 Material: label each section with tabs protected with celluloid covers fastened to hard paper dividing sheets.
- .6 Type lists and notes.
- .7 Drawings, diagrams and manufacturers literature must be legible.
- .8 Binders:
  - .1 Binders: vinyl, hard covered, 3 "D" ring, loose leaf, sized for 8½" x 11" paper, with spine pocket.
  - .2 Identify contents of each binder on spline.
- .9 Contents
  - .1 Binder 1:
    - .1 Cover sheet containing:
      - .1 Date submitted.
      - .2 Project title, location and project number.
    - .2 Names and addresses of Contractor, and all Sub-contractors.
    - .3 Table of Contents of all binders.
    - .4 List of maintenance materials.
    - .5 List of special tools.
    - .6 List of spare parts.
    - .7 Warranties, guarantees.
    - .8 Copies of approvals, and certificates.
  - .2 Remaining binders:
    - .1 Cover sheet containing:
      - .1 Date submitted.
      - .2 Project title, location and project number.
      - .3 Table of Contents of individual binder.
    - .2 Provide data as specified in individual sections of specifications.
    - .3 List of equipment including service depot.
    - .4 Nameplate information including equipment number, make, size, capacity, model number and serial number.
    - .5 Parts list.
    - .6 Installation details.
    - .7 Operating instructions.
    - .8 Maintenance instructions for equipment.
    - .9 Maintenance instructions for finishes.
    - .10 Shop drawings:

- .1 Bind separately one complete set of reviewed final shop drawings and product data.

**1.7 AS-BUILT DRAWINGS**

- .1 During the progress of the work, the Contractor shall record all modifications, alterations, or additions to the design or shop drawings.
- .2 Subsequent to the completion of the work and prior to issuance of the Final Certificate of Completion, the Contractor shall provide to the AAFC Site Representative, one set of the modified drawings.
- .3 All dimensions shown on the drawings shall be in metric (SI) units. A note placed on each drawing shall identify the metric units used.

**END OF SECTION**

**Part 1 GENERAL**

**1.1 PROJECT CLEANLINESS**

- .1 The Contractor shall confine equipment, the storage of materials and the operations of workmen to limits indicated by law, ordinances, permits or directions of the AAFC Site Representative and shall not unreasonably encumber the work area with his materials.
- .2 Clean-up shall be a continuous, daily process from the start of the work to final acceptance of the project.
- .3 Maintain Work in tidy condition, free from accumulation of waste products and debris caused by employees or the Work.
- .4 Remove waste materials from site daily to prevent accumulation, at locations approved by AAFC Site Representative.
- .5 Accumulation of waste material which might constitute a fire hazard will not be permitted.
- .6 Provide and use clearly marked separate bins for recycling.
- .7 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- .12 Spillage from Contractor's vehicles on public or private road shall be promptly cleaned up.

**1.2 FINAL CLEANING**

- .1 When Work is Substantially Performed, remove temporary structures, surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 All cleaning operations shall be subject to the approval of the AAFC Site Representative.
- .3 Remove waste products and debris and leave Work clean and suitable for occupancy.
- .4 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.

- .5 Clean any affected lighting reflectors, lenses, and other lighting surfaces.
- .6 Vacuum clean and dust any affected building interiors, behind grilles, louvres and screens.
- .7 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .8 Remove dirt and other disfiguration from exterior surfaces.

**END OF SECTION**

**Part 1 GENERAL**

**1.1 REFERENCES**

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

**1.2 SUBMITTALS**

- .1 Submittals in accordance with Section 01 33 00 - Submittals.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature and datasheets for product characteristics, performance criteria, physical size, finish, and limitations.
- .3 Shop Drawings.
  - .1 Submit shop drawings to indicate:
    - .1 Equipment, including connections, fittings, control assemblies and ancillaries. Identify whether factory or field assembled.
    - .2 Wiring and schematic diagrams.
    - .3 Dimensions and recommended installation.
    - .4 Pump performance and efficiency curves.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Instructions: submit manufacturer's installation instructions.
- .6 Manufacturers' Field Reports: manufacturers' field reports specified.
- .7 Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 33 00 - Submittals, include:
  - .1 Manufacturers name, type, model year, capacity and serial number.
  - .2 Details of operation, servicing and maintenance.
  - .3 Recommended spare parts list with names and addresses.

**1.3 QUALITY ASSURANCE**

- .1 Pre-Installation Meeting:
  - .1 Convene pre-installation meeting one week prior to beginning on-site installations.
    - .1 Verify project requirements.
    - .2 Review installation and substrate conditions.
    - .3 Co-ordination with other building subtrades.
    - .4 Review manufacturer's installation instructions and warranty requirements.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Store and manage hazardous materials in accordance with manufacturer's instructions.

**Part 2 PRODUCTS**

**2.1 DOMESTIC WATER BOOSTER PUMP**

- .1 Domestic water single booster pump package complete with VFD.
- .2 Packaged system, factory assembled, tested and adjusted, ready for site piping and electrical connections.
- .3 Total Capacity: To be calculated by the supplier to meet the needs of the facility
- .4 Construction: To be designed by the supplier to meet the needs of the facility
- .5 Valves: To be designed by the supplier to meet the needs of the facility
- .6 Motor:
- .7 To be designed by the supplier to meet the needs of the facility



Operation:

- .1 Adjustable time delay to maintain starting pump operation and avoid "on-off " cycling.
- .2 Low suction pressure switch to stop pump.
- .3 Temperature control for low or no system demand to bleed to drain.
- .4 Acceptable manufacturer:
  - .1 Grundfos
  - .2 Goulds

**Part 3 EXECUTION**

**3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

**1.2 INSTALLATION**

- .1 Make piping and electrical connections to pump and motor assembly and controls as indicated.
- .2 Ensure pump and motor assembly do not support piping.
- .3 Align vertical pit mounted pump assembly after mounting and securing cover plate.
- .4 Make provisions for future expansion; to include additional booster pump installation.

**1.3 FIELD QUALITY CONTROL**

- .1 Site Tests/Inspection:
  - .1 Check power supply.
  - .2 Check starter protective devices.
- .2 Start-up, check for proper and safe operation.
- .3 Check settings and operation of hand-off-auto selector switch, operating, safety and limit controls, audible and visual alarms, over-temperature and other protective devices.
- .4 Adjust flow from water-cooled bearings.
- .5 Adjust impeller shaft stuffing boxes, packing glands.

**1.4 START-UP**

- .1 Procedures:
  - .1 Check power supply.
  - .2 Check starter O/L heater sizes.
  - .3 Start pumps, check impeller rotation.
  - .4 Check for safe and proper operation.
  - .5 Check settings, operation of operating, limit, safety controls, over-temperature, audible/visual alarms, other protective devices.
  - .6 Test operation of hands-on-auto switch.
  - .7 Test operation of alternator.
  - .8 Adjust leakage through water-cooled bearings.
  - .9 Adjust shaft stuffing boxes.
  - .10 Adjust leakage flow rate from pump shaft stuffing boxes to manufacturer's recommendations.
  - .11 Check base for free-floating, no obstructions under base.
  - .12 Run-in pumps for 12 continuous hours.
  - .13 Check installation, operation of mechanical seals, packing gland type seals. Adjust as necessary.
  - .14 Adjust alignment of piping and conduit to ensure full flexibility.
  - .15 Eliminate causes of cavitation, flashing, air entrainment.
  - .16 Measure pressure drop across strainer when clean and with flow rates as finally set.
  - .17 Replace seals if pump used to degrease system or if pump used for temporary heat.
  - .18 Verify lubricating oil levels.

**1.5 PERFORMANCE VERIFICATION (PV) PRESSURE BOOSTER PUMPS**

- .1 Obtain manufacturer's approval, before performing PV, to ensure warranties remain intact.
- .2 Application tolerances:
  - .1 Flow: +/- 10%.
  - .2 Pressure: + 20%, - 5%.
- .3 PV procedures:
  - .1 Open pump balancing valve fully.
  - .2 Measure differential pressure (DP) across pump.
  - .3 Measure amperage and voltage and compare with manufacturer's data sheets and motor nameplate data.
  - .4 If suction is different size than discharge connection, add velocity head correction factor to DP.
  - .5 Mark this DP on manufacturer's pump curve.
  - .6 If flow rate is higher than specified, slow close balancing valve until specified DP is reached.

- .7 Repeat measurements of amps and volts. Compare with manufacturer's data sheets.
- .8 Calculate BHP and compare with nameplate data.

**1.6 REPORTS**

- .1 In accordance with Section 01 33 00 - Submittals: provide commissioning reports.
- .2 Include:
  - .1 PV results on approved PV Report Forms.
  - .2 Product Information report forms.
  - .3 Pump performance curves (family of curves) with final point of actual performance.

**1.7 TRAINING**

- .1 Training of O&M Personnel to be completed as scheduled by AAFC Site Representative.

**END OF SECTION**

**Part 1 GENERAL**

**1.1 REFERENCES**

- .1 Refer to the most current version of the following references or as dictated by the latest local codes.
- .2 American National Standards Institute (ANSI)/American Society of Mechanical Engineers International (ASME)
  - .1 ANSI/ASME B16.3, Malleable Iron Threaded Fittings.
  - .2 ANSI/ASME 16.5, Pipe Flanges and Flanged Fittings.
  - .3 ANSI/ASME B16.9, Factory-Made Wrought Steel Butt welding Fittings.
  - .4 ANSI/ASME B16.15, Cast Bronze Threaded Fittings.
  - .5 ANSI/ASME B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.
  - .6 ANSI/ASME B16.22, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
  - .7 ANSI/ASME B16.24, Cast Copper Alloy Pipe Flanges and Flanged Fittings.
  - .8 ANSI/ASME B16.34, Valves – Flanged, Threaded, and Welding End.
- .3 American Society for Testing and Materials International (ASTM).
  - .1 ASTM A47, Ferritic Malleable Iron Castings.
  - .2 ASTM A53, Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - .3 ASTM A240, Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
  - .4 ASTM A304, Carbon Alloy Steel Bars Subject to End-Quench Hardenability Requirements.
  - .5 ASTM A307, Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .6 ASTM A774, As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures.
  - .7 ASTM A778, Welded, Unannealed Austenitic Stainless Tubular Products.
  - .8 ASTM B42, Seamless Copper Pipe, Standard Sizes.
  - .9 ASTM B88, Seamless Copper Water Tube.
- .4 American Water Works Association (AWWA)
  - .1 AWWA C111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
- .5 Canadian Standards Association (CSA) International
  - .1 CSA B242, Groove- and Shoulder-Type Mechanical Pipe Couplings.
  - .2 CSA W47.1, Welding and Structural Metals
- .6 NSF International
  - .1 NSF/ANSI Standard 61 – Drinking Water System Components – Health Effects
- .7 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999, c. 33 (CEPA).

- .8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .9 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS).
  - .1 MSS-SP-67, Butterfly Valves.
  - .2 MSS-SP-70, Gray Iron Gate Valves, Flanged and Threaded Ends.
  - .3 MSS-SP-71, Gray Iron Swing Check Valves, Flanged and Threaded Ends.
  - .4 MSS-SP-80, Bronze Gate, Globe, Angle and Check Valves.
- .10 National Research Council Canada (NRC)
  - .1 National Plumbing Code (NPC).
- .11 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992, c. 34 (TDGA).

## 1.2 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Product Data:
  - .1 Provide manufacturer's printed product literature and datasheets for insulation and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

## Part 2 PRODUCTS

### 2.1 DOMESTIC PIPING ABOVE GROUND

- .1 Copper pipe:
  - .1 Type L hard copper tube, hard drawn, to ASTM B42 with sweat wrought copper fittings to ANSI/ASME B16.22 joined with 95-5 tin-antimony or 94-6 tin silver solder; NO LEAD.
  - .2 Where required, make joint with threaded, compression or flair type adaptors; use Teflon tape applied to male thread only.
- .2 Steel pipe:
  - .1 Steel water pipe to ASTM A53, Grade B. Schedule 40 with Class 150 fittings.
  - .2 Joints:
    - .1 50 mm and under: screwed malleable iron fittings to ANSI B16.3, Class 150.
    - .2 Greater than 50 mm: Welding fittings and flanges to CSA W47.1 and CSA W47.151.
    - .3 Unions: Malleable iron, to ASTM A47M and ANSI/ASME B16.3.

- .3 Schedule Stainless Steel (SSS):
  - .1 Pipe material: 304L stainless steel.
  - .2 All pipe and fittings shall be manufactured to ASTM A-778 or A-774 from sheet and plate of domestic origin confirming to ASTM A-240, A-304L. Sheet finish shall be plate finish No. 1.
  - .3 Pipe and fittings for service up to 1034 kPa operating pressure and maximum 95°C and shall be supplied in the following nominal wall thicknesses: Schedule 10.
  - .4 Welding in fabricator's shop and in the field shall be performed by qualified welders to approved procedures. Welding rod or wire shall be of the same composition or superior to the pipe and fitting material. The weld deposit at the seam shall have a slight crown on both sides of the weld and no cracks or crevices shall be allowed. Excessive weld deposits, slag, weld splatter and projections into interior of the pipe shall be removed by grinding.
- .4 All new potable water pipes are to be labelled "POTABLE WATER".

## 2.2 FITTINGS

- .1 Copper pipe:
  - .1 Bronze pipe flanges and flanged fittings, Class 150 to ANSI/ASME B16.24.
  - .2 Cast bronze threaded fittings, Class 125 to ANSI/ASME B16.15.
  - .3 Cast copper, solder type: to ANSI/ASME B16.18.
  - .4 Wrought copper and copper alloy, solder type: to ANSI/ASME B16.22.
  - .5 NPS 2 and larger: roll grooved to CSA B242.
- .2 Steel pipe:
  - .1 50 mm and under: screwed malleable iron fittings to ANSI B16.3, Class 150.
  - .2 Larger than 50 mm: Welding fittings and flanges to CSA W 47.1 and CSA W47.151.
  - .3 Unions: Malleable iron, to ASTM A47M and ANSI/ASME B16.3.
- .3 Schedule Stainless Steel (SSS):
  - .1 Fittings: elbows to 600 mm shall be smooth flow Schedule 10 design.
  - .2 Stub-ends Type A: shall be 304L stainless steel confirming to ASTM A-240 and shall be pressed type Schedule 10S, supplied with beveled ends to ASME B16.9.
  - .3 Flanges: ANSI/ASME 150 pound stainless steel, slip-on.
  - .4 Gaskets: 3.2 mm thick Garlock Blue Guard or approved equal.
  - .5 Minimize field welding of pipe.
  - .6 Bolt assemblies shall be 316 stainless steel, conforming to ANSI B18.2.1.

## 2.3 BALL VALVES

- .1 NPS 2 and under, screwed:
  - .1 Class 150.
  - .2 Bronze body, chrome plated brass ball, PTFE adjustable packing, brass gland and PTFE seat, 1/4 turn lever steel lever handle.
- .2 NPS 2 and under, soldered:
  - .1 To ANSI/ASME B16.18, Class 150.
  - .2 Bronze body, chrome plated brass ball, PTFE adjustable packing, brass gland and PTFE seat, steel lever handle, with NPT to copper adaptors.

## 2.4 BUTTERFLY VALVES

- .1 NPS 2.5 and over, Flanged connections (stainless steel):
  - .1 To be suitable for dead-end service.
  - .2 CRN (Canadian Registration Number) required for products.
  - .3 Sizes: Lug type: NPS 2 to 30.
  - .4 Pressure rating for tight shut-off at temperatures up to maximum for seat material.
    - .1 NPS 2 - 12: 200 psig.
  - .5 Minimum seat temperature ratings to 135°C.
  - .6 Application: on-off operation.
  - .7 Full lug body (threaded).
  - .8 Operators:
    - .1 NPS 2 - 6: Handles capable of locking in any of ten (10) positions - 0 degrees to 90 degrees. Handle and release trigger - ductile iron. Return spring and hinge pin: carbon steel. Latch plate and mounting hardware: cadmium plated carbon steel. Standard coating: black laquer.
  - .9 Designed to comply with MSS SP-67 and API 609.
  - .10 Compatible with ANSI Class 125/Class 150 flanges.
  - .11 Construction:
    - .1 Body: ductile iron.
    - .2 Disc: aluminum bronze.
    - .3 Seat: EPDM.
    - .4 Shaft: 316 stainless steel.
    - .5 Taper pin: 316 SS or Monel.
    - .6 Key: carbon steel or stainless.
    - .7 O-Ring: Buna-N.
    - .8 Bushings: Luberized bronze.

**Part 3 EXECUTION**

**3.1 APPLICATION**

- .1 Contractor shall be responsible for the correct installation and assembly of all items of equipment.
- .2 Comply with Manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- .3 Any damage resulting from either a failure to observe the Manufacturer's instructions or proceeding with the work without complete knowledge will be the Contractor's responsibility who shall correct any loss or damage.

**3.2 INSTALLATION**

- .1 Install in accordance with National Plumbing Code of Canada and Provincial Plumbing Code.
- .2 Assemble piping using fittings manufactured to ANSI standards.
- .3 Install CWS piping below and away from HWS and HWC and other hot piping so as to maintain temperature of cold water as low as possible.
- .4 Connect to fixtures and equipment in accordance with Manufacturer's written instructions unless otherwise indicated.

**3.3 VALVES**

- .1 Isolate equipment, fixtures and branches with ball valves.

**3.4 PRESSURE TESTS**

- .1 Test pressure: greater of 1.3 times maximum system operating pressure ~~or 860 kPa, which ever is greater.~~
- .2 Conduct hydrostatic pressure and hydrostatic leakage tests in the presence of the Owner.
- .3 Line to be tested as installed. If test fails, no further line is to be installed until the test section is repaired and retested.
- .4 Duration of test shall be two hours.
- .5 Test section must be either a section between valves or completed pipe run/network.
- .6 Hydrostatic Pressure Test:
  - .1 Fill test section slowly with water making sure that all air is removed.
  - .2 Allow a period of 24 hours before starting test, except for plastic pipe.
  - .3 Subject test section to continuous test pressure specified for one hour.
  - .4 Examine all parts of test section while under pressure. If test pressure is maintained with no pressure drop for specified test duration, test result is satisfactory.



- .5 If test result is not satisfactory, repair all deficient parts of section and retest until satisfactory result is attained.

### **3.5 FLUSHING AND CLEANING**

- .1 Flush entire system for eight hours. Ensure outlets are flushed for two hours. Let stand for 24 hours, then draw one sample off longest run. Submit to testing laboratory to verify that system is clean to Provincial and National Potable Water Guidelines. Let system flush for additional two hours, then draw off another sample for testing.

### **3.6 PRE-START-UP INSPECTIONS**

- .1 Systems to be complete, prior to flushing, testing and start-up.
- .2 Verify that system can be completely drained.
- .3 Ensure that pressure booster systems are operating properly.
- .4 Ensure that air chambers, expansion compensators are installed properly.

### **3.7 DISINFECTION**

- .1 Newly installed, repaired or altered potable water systems shall be thoroughly cleaned and flushed to ensure cleanliness and freedom from contamination.
- .2 Flush system after completion of work allowing full flow of water through the system for a period of 15 minutes.
- .3 Provide contact sterilization treatment of potable water piping by treating water with chlorine solution in accordance with the requirements of the Provincial and National Plumbing Codes. Flush system thereafter to remove chlorine content to an acceptable level.
- .4 Upon completion, provide laboratory test reports on water quality for AAFC Site Representative approval.
- .5 De-chlorination of system and disposal of flushing water. Flushing water not to be sent to septic system.

### **3.8 START-UP**

- .1 Start-up after:
  - .1 Pressure tests have been completed.
  - .2 Disinfection procedures have been completed.
  - .3 Certificate of static completion has been issued.
  - .4 Water treatment systems operational.
- .2 Provide continuous supervision during start-up.

- .3 Start-up procedures:
  - .1 Establish circulation and ensure that air is eliminated.
  - .2 Check pressurization to ensure proper operation and to prevent water hammer, flashing and/or cavitation.
  - .3 Bring HWS storage tank up to design temperature slowly.
  - .4 Monitor piping HWS and HWC piping systems for freedom of movement, pipe expansion as designed.
  - .5 Check control, limit, safety devices for normal and safe operation.
- .4 Rectify start-up deficiencies.

### **3.9 PERFORMANCE VERIFICATION (PV)**

- .1 Scheduling:
  - .1 Verify system performance after pressure and leakage tests and disinfection are completed, and Certificate of Completion has been issued by AAFC Site Representative.
- .2 Procedures:
  - .1 Verify that flow rate and pressure meet Design Criteria.
  - .2 Sterilize HWS and HWC systems for Legionella control.
  - .3 Verify performance of temperature controls.
  - .4 Verify compliance with safety and health requirements.
  - .5 Confirm water quality consistent with supply standards, and ensure no residuals remain as result of flushing or cleaning.

**END OF SECTION**

**Part 1 GENERAL**

**1.1 REFERENCES**

- .1 Refer to the most current version of the following references or as dictated by the latest local codes.
- .2 American Society for Testing and Materials International (ASTM).
  - .1 ASTM A126, Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
  - .2 ASTM B62, Standard Specification for Composition Bronze or Ounce Metal Castings.
- .3 American Water Works Association (AWWA).
  - .1 AWWA C510 – Double Check Valve Backflow Prevention Assembly.
  - .2 AWWA C511 – Reduced Pressure Principle Backflow Prevention Assembly.
- .4 Canadian Standards Association (CSA International).
  - .1 CSA-B64 Series, Backflow Preventers and Vacuum Breakers.
  - .2 CSA-B79, Floor, Area and Shower Drains, and Cleanouts for Residential Construction.
  - .3 CSA-B356, Water Pressure Reducing Valves for Domestic Water Supply Systems.
- .5 American National Standards Institute (ANSI)
  - .1 ANSI A112.1.3 – Air Gap Fitting for Use with Plumbing Fixtures, Appliances, and Appurtenances.
- .6 American Society for Sanitary Engineers (ASSE)
  - .1 ASSE Standard 1011 – Hose Connection Vacuum Breakers.
- .7 National Research Council Canada (NRC)
  - .1 National Plumbing Code (NPC).
- .8 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .9 Plumbing and Drainage Institute (PDI).
  - .1 PDI-WH201, Water Hammer Arresters Standard.
- .10 NSF International
  - .1 NSF/ANSI Standard 61 – Drinking Water System Components – Health Effects

**1.2 SUBMITTALS**

- .1 Submittals in accordance with Section 01 33 00.
- .2 Product Data:

- .1 Provide manufacturer's printed product literature and datasheets for product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings.
  - .1 Submit shop drawings to indicate:
    - .1 Equipment, including connections, fittings, control assemblies, and ancillaries. Identify whether factory or field assembled.
    - .2 Wiring and schematic diagrams.
    - .3 Dimensions and recommended installation.
    - .4 Pump performance and efficiency curves.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Instructions: submit manufacturer's installation instructions.
- .6 Manufacturers' Field Reports: manufacturers' field reports specified.
- .7 Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 33 00 - Submittals, include:
  - .1 Manufacturers name, type, model year, capacity, and serial number.
  - .2 Details of operation, servicing and maintenance.
  - .3 Recommended spare parts list with names and addresses.

### **1.3 QUALITY ASSURANCE**

- .1 Pre-Installation Meeting:
  - .1 Convene pre-installation meeting one week prior to beginning on-site installations.
    - .1 Verify project requirements.
    - .2 Review installation and substrate conditions.
    - .3 Co-ordination with other building subtrades.
    - .4 Review manufacturer's installation instructions and warranty requirements.

### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Store and manage hazardous materials in accordance with manufacturer's instructions.

## **Part 2 PRODUCTS**

### **2.1 STRAINERS**

- .1 Y type with 20 mesh, monel, bronze, or stainless steel removable screen.
- .2 NPS2 and under, bronze body, screwed ends, with brass cap.
- .3 NPS2 1/2 and over, cast iron body, flanged ends, with bolted cap.

**Part 3 EXECUTION**

**3.1 APPLICATON**

- .1 Contractor shall be responsible for the correct installation and assembly of all items of equipment.
- .2 Comply with Manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- .3 Any damage resulting from either a failure to observe the Manufacturer's instructions or proceeding with the work without complete knowledge will be the Contractor's responsibility; the Contractor shall correct any loss or damage.

**3.2 STRAINERS**

- .1 Install with sufficient room to remove basket.

**3.3 EXPANSION TANKS**

- .1 Adjust expansion tank pressure to suit design criteria.

**3.4 START-UP**

- .1 Timing: start-up only after:
  - .1 Pressure tests have been completed.
  - .2 Disinfection procedures have been completed.
  - .3 Certificate of static completion has been issued.
  - .4 Water treatment systems operational.
- .2 Provide continuous supervision during start-up.

**3.5 INSTALLATION**

- .1 Install in accordance with National Plumbing Code of Canada and Provincial Plumbing Code.
- .2 Install in accordance with manufacturer's instructions and as specified.

**3.6 TESTING AND ADJUSTING**

- .1 Timing:
  - .1 After start-up deficiencies rectified.
  - .2 After certificate of completion has been issued by authority having jurisdiction.
- .2 Adjustments:
  - .1 Verify that flow rate and pressure meet design criteria.
  - .2 Make adjustments while flow rate or withdrawal is (1) maximum and (2) 25% of maximum and while pressure is (1) maximum and (2) minimum.
- .3 Strainers:

- .1 Clean out repeatedly until clear.
- .2 Verify accessibility of cleanout plug and basket.
- .3 Verify that cleanout plug does not leak.

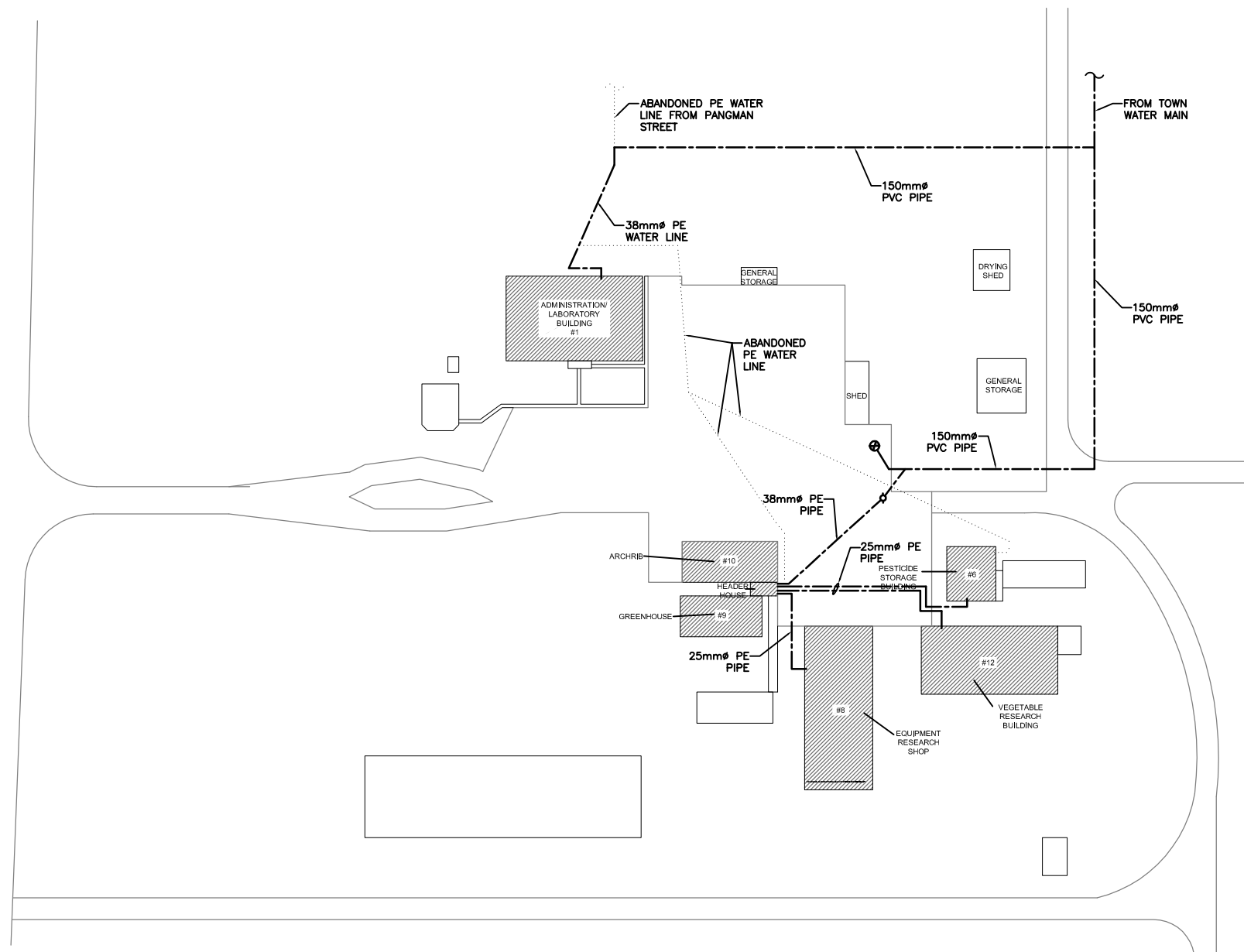
**END OF SECTION**



**LIST OF DRAWINGS:**

- DOMESTIC WATER SYSTEM AS-BUILT  
 DWS-1 SITE PLAN DOMESTIC WATER SYSTEM AND PLUMBING LEGEND  
 DWS-2 ADMINISTRATIVE BUILDING DOMESTIC WATER SUPPLY  
 DWS-3 CHEMICAL STORAGE BUILDING DOMESTIC WATER SUPPLY  
 DWS-4 EQUIPMENT REPAIR SHOP BUILDING DOMESTIC WATER SUPPLY  
 DWS-5 GREENHOUSE BUILDING DOMESTIC WATER SUPPLY  
 DWS-6 VEGETABLES RESEARCH BUILDING MAIN FLOOR DOMESTIC WATER SUPPLY  
 DWS-7 VEGETABLES RESEARCH BUILDING MEZZANINE DOMESTIC WATER SUPPLY

- BACKFLOW PREVENTION SCHEMATIC RECOMMENDATION  
 MP-1 ADMINISTRATIVE BUILDING #1 BACKFLOW PREVENTION SCHEMATIC  
 MP-2 CHEMICAL STORAGE BUILDING #6 BACKFLOW PREVENTION SCHEMATIC  
 MP-3 EQUIPMENT REPAIR SHOP BLDG #8 BACKFLOW PREVENTION SCHEMATIC  
 MP-4 GREENHOUSE BUILDING #9 BACKFLOW PREVENTION SCHEMATIC  
 MP-5 VEGETABLES RESEARCH BLDG #12 BACKFLOW PREVENTION SCHEMATIC



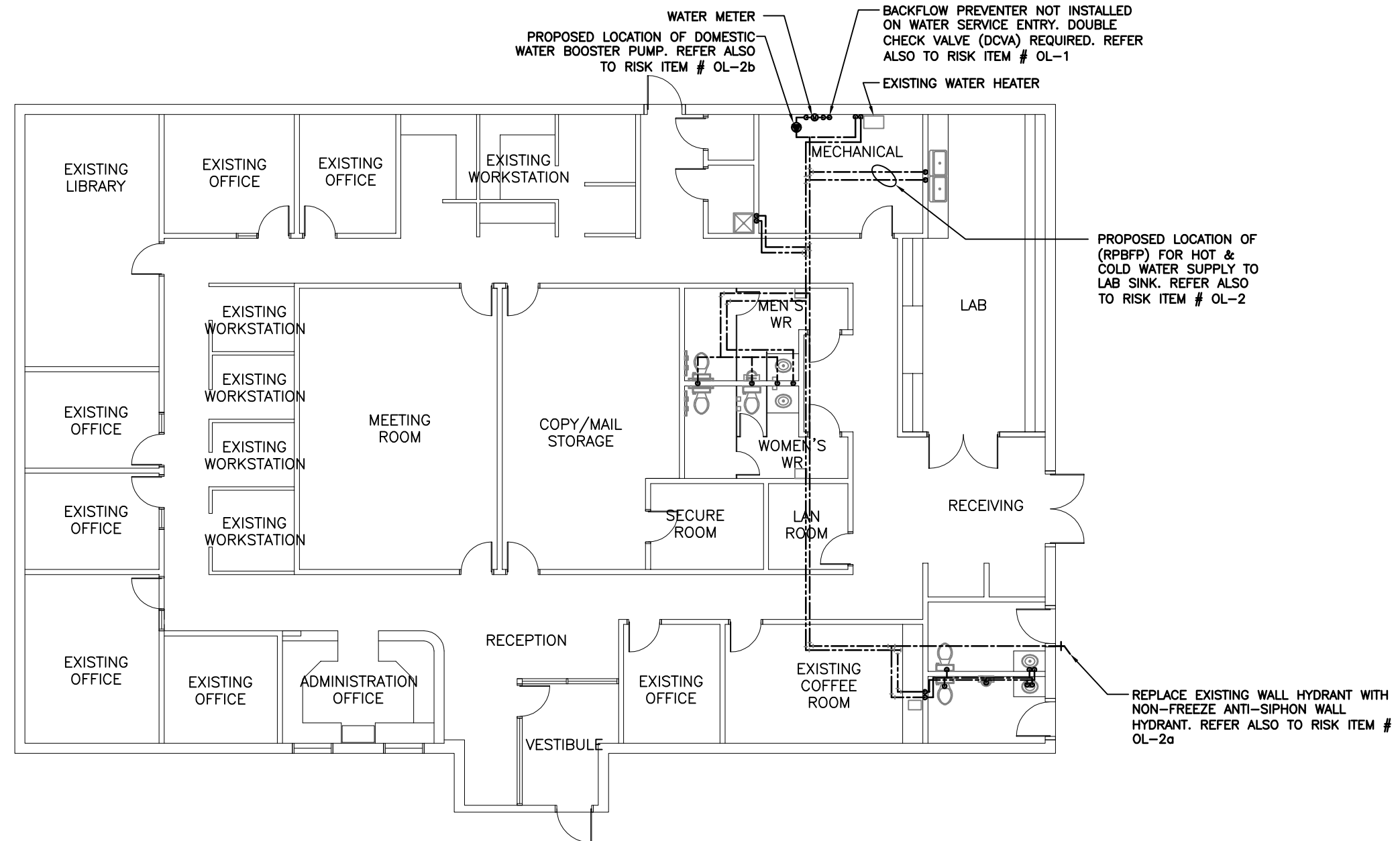
1 SITE PLAN  
NOT TO SCALE

PLUMBING LEGEND	
-----	DOMESTIC COLD WATER
-----	DOMESTIC HOT WATER
-----	DOMESTIC HOT WATER RECIRC.
---TW---	TEMPERED WATER
⋈	SHUT-OFF VALVE/GATE VALVE
⊘	BALL VALVE
⌞	CHECK VALVE
⊕	TEMPERATURE MIXING VALVE
⊙	METER (FLOW OR WATER)
⊘	(DCVA) BACKFLOW PREVENTER
⊘	(RPBFP) BACKFLOW PREVENTER
⊕	PRESSURE-RELIEF VALVE
— — —	UNION
⌈	PIPE CAP
⌋	PIPE BREAK
◆	CURB STOP
⊙	FIRE HYDRANT

**AS-BUILT**

**DO NOT SCALE DRAWINGS**

Client/client <b>PUBLIC WORKS GOVERNMENT SERVICE CANADA</b>  350 KING EDWARD AVENUE OTTAWA, ONTARIO	Project title/Titre du projet <b>AGRICULTURAL AND ARG-FOODS CANADA SANITARY AND CROSS-CONNECTION CONTROL SURVEY</b>  <b>OUTLOOK, SASKATCHEWAN</b>	Drawing title/Titre du dessin <b>SITE LOCATION DOMESTIC WATER SUPPLY PLUMBING LEGEND AS-BUILT</b>	Approved by/Approuvé par DH	PWGSC Project Manager/Administrateur de Projets TPSGC VINCE RIGG	Project No./No. du projet R.072268	
			Designed by/Concept par RR	PWGSC, Architectural and Engineering Resource Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC (TO BE DETERMINE)	Sheet/Feuille <b>DWS-1</b>	Revision/ Révision
			Drawn by/Dessiné par IS	Date/Date 2015-01-30	<b>OF 7</b>	



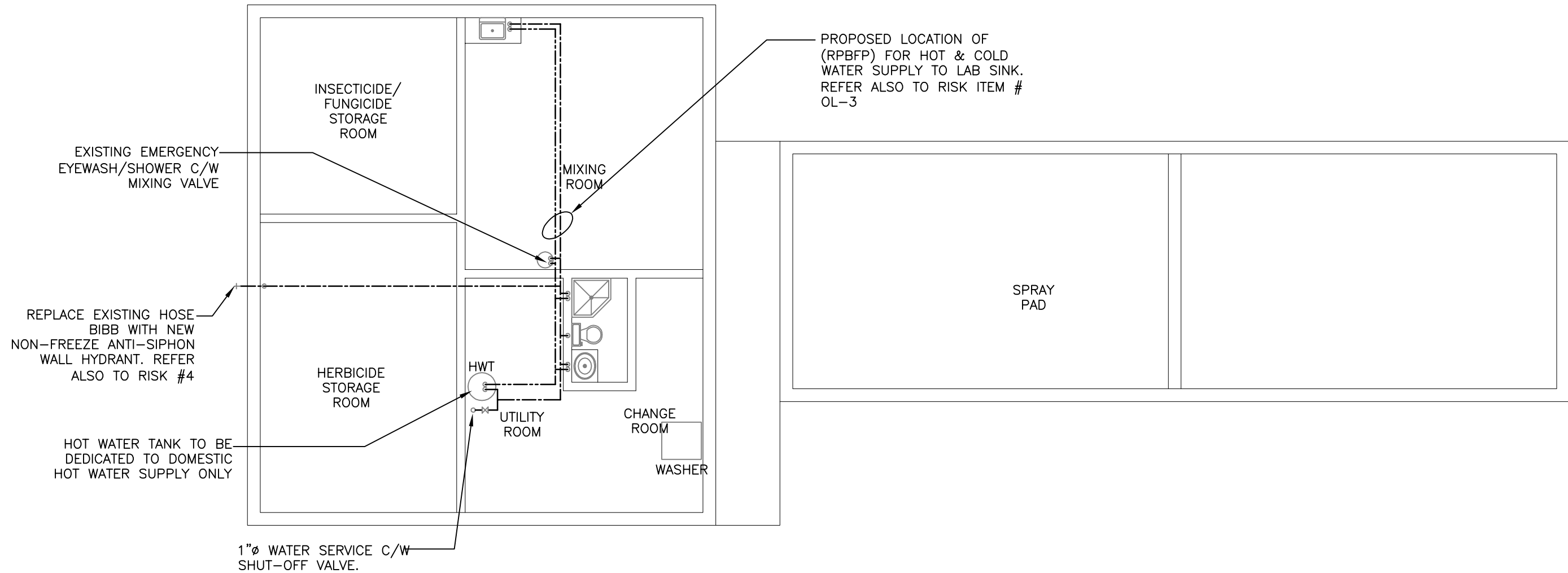
1  
- -  
ADMINISTRATIVE BLDG.  
DOMESTIC WATER SUPPLY  
1:150

**AS-BUILT**

**DO NOT SCALE DRAWINGS**

<b>Client/client</b> <b>PUBLIC WORKS GOVERNMENT SERVICE CANADA</b>  350 KING EDWARD AVENUE OTTAWA, ONTARIO	<b>Project title/Titre du projet</b> <b>AGRICULTURAL AND ARG-FOODS CANADA SANITARY AND CROSS-CONNECTION CONTROL SURVEY</b>  <b>OUTLOOK, SASKATCHEWAN</b>	<b>Drawing title/Titre du dessin</b> <b>ADMINISTRATIVE BUILDING BUILDING #1 DOMESTIC WATER SUPPLY AS-BUILT</b>	<b>Approved by/Approve par</b> DH	<b>PWSC Project Manager/Administrateur de Projets TPSGC</b> Vince Rigg	<b>Project No./No. du projet</b> R.072268	
			<b>Designed by/Concept par</b> RR	<b>PWSC, Architectural and Engineering Resource Manager/ Ressources Architectural et de Directeur d'Ingénierie, TPSGC</b> (TO BE DETERMINED)	<b>Sheet/Feuille</b>  <b>DWS 2</b>	<b>Revision/ Révision</b>
			<b>Drawn by/Dessine par</b> IS	<b>Date/Date</b>  2015-01-30	<b>OF 7</b>	



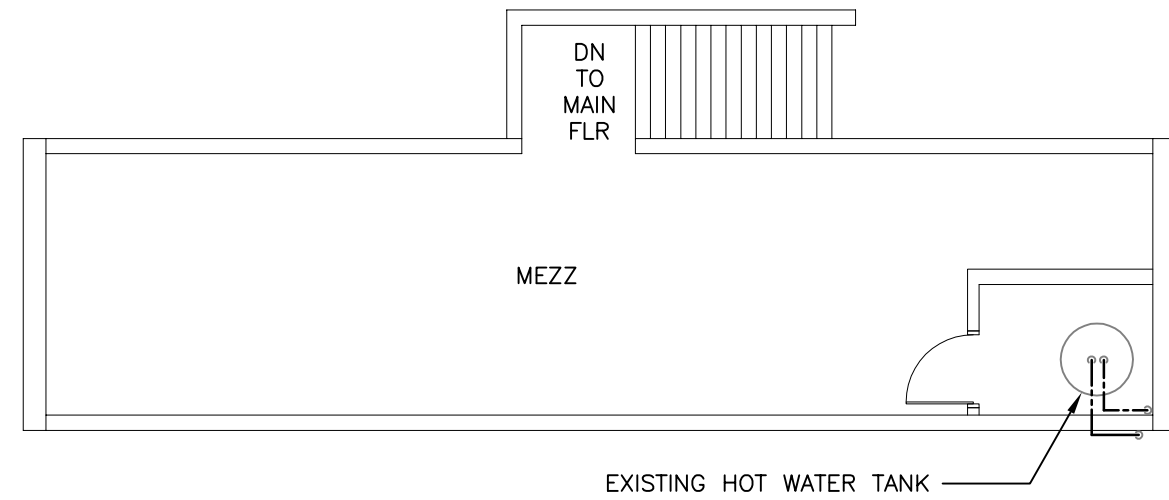
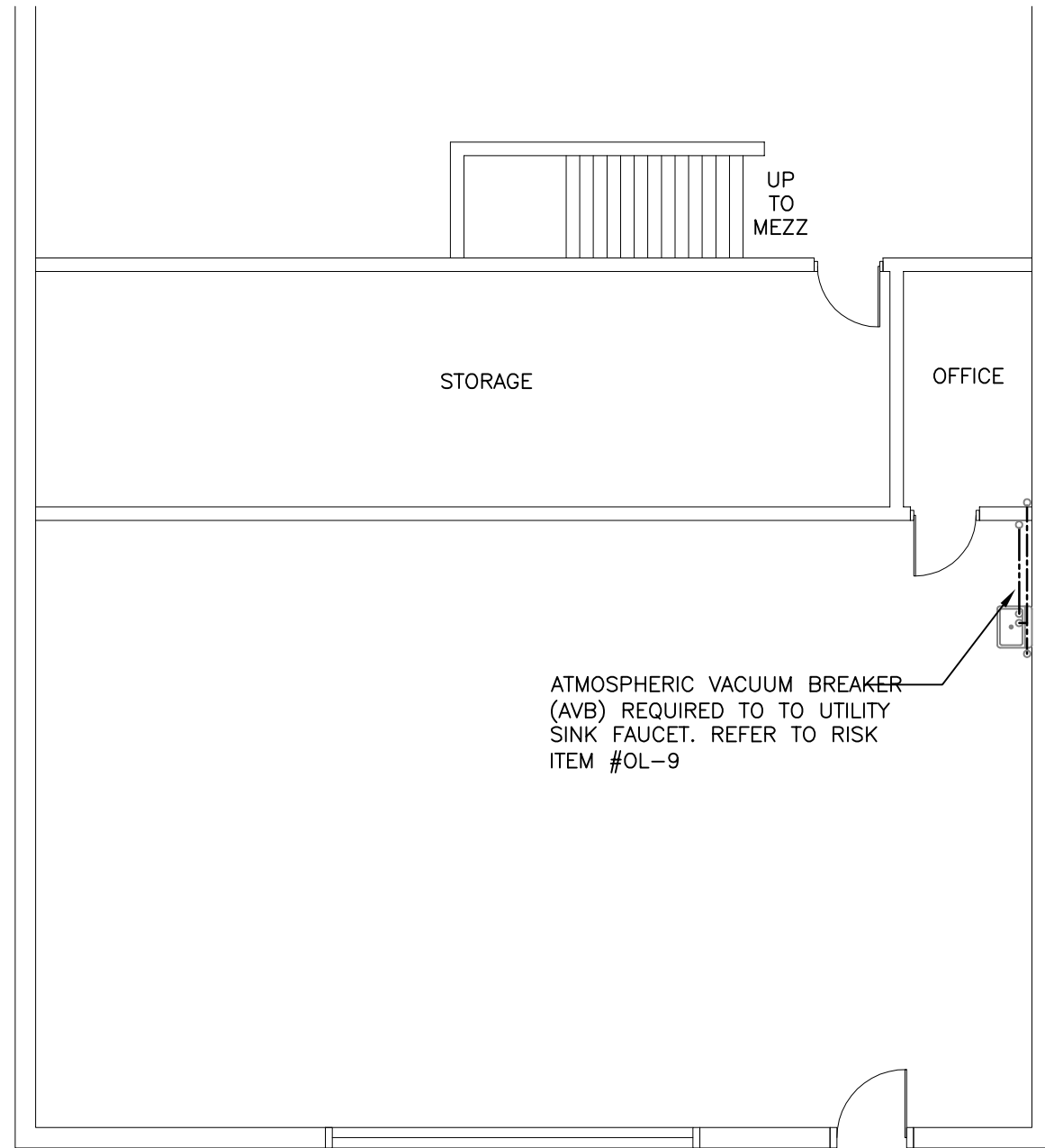


1  
- -  
CHEMICAL STORAGE BUILDING  
DOMESTIC WATER SUPPLY  
1:100

**AS-BUILT**

**DO NOT SCALE DRAWINGS**

<b>Client/client</b> <b>PUBLIC WORKS GOVERNMENT SERVICE CANADA</b>  350 KING EDWARD AVENUE OTTAWA, ONTARIO	<b>Project title/Titre du projet</b> AGRICULTURAL AND ARG-FOODS CANADA SANITARY AND CROSS-CONNECTION CONTROL SURVEY  OUTLOOK, SASKATCHEWAN	<b>Drawing title/Titre du dessin</b> CHEMICAL STORAGE BLDG. BUILDING #6 DOMESTIC WATER SUPPLY AS-BUILT	<b>Approved by/Approve par</b> DH	<b>PWGSC Project Manager/Administrateur de Projets TPSGC</b> Vince Rigg	<b>Project No./No. du projet</b> R.072268	
			<b>Designed by/Concept par</b> RR	<b>PWGSC, Architectural and Engineering Resource Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC</b> (TO BE DETERMINED)	<b>Sheet/Feuille</b> <b>DWS 3</b>	<b>Revision/ Révision</b>
			<b>Drawn by/Dessiné par</b> IS	<b>Date/Date</b> 2015-01-30	<b>OF 7</b>	



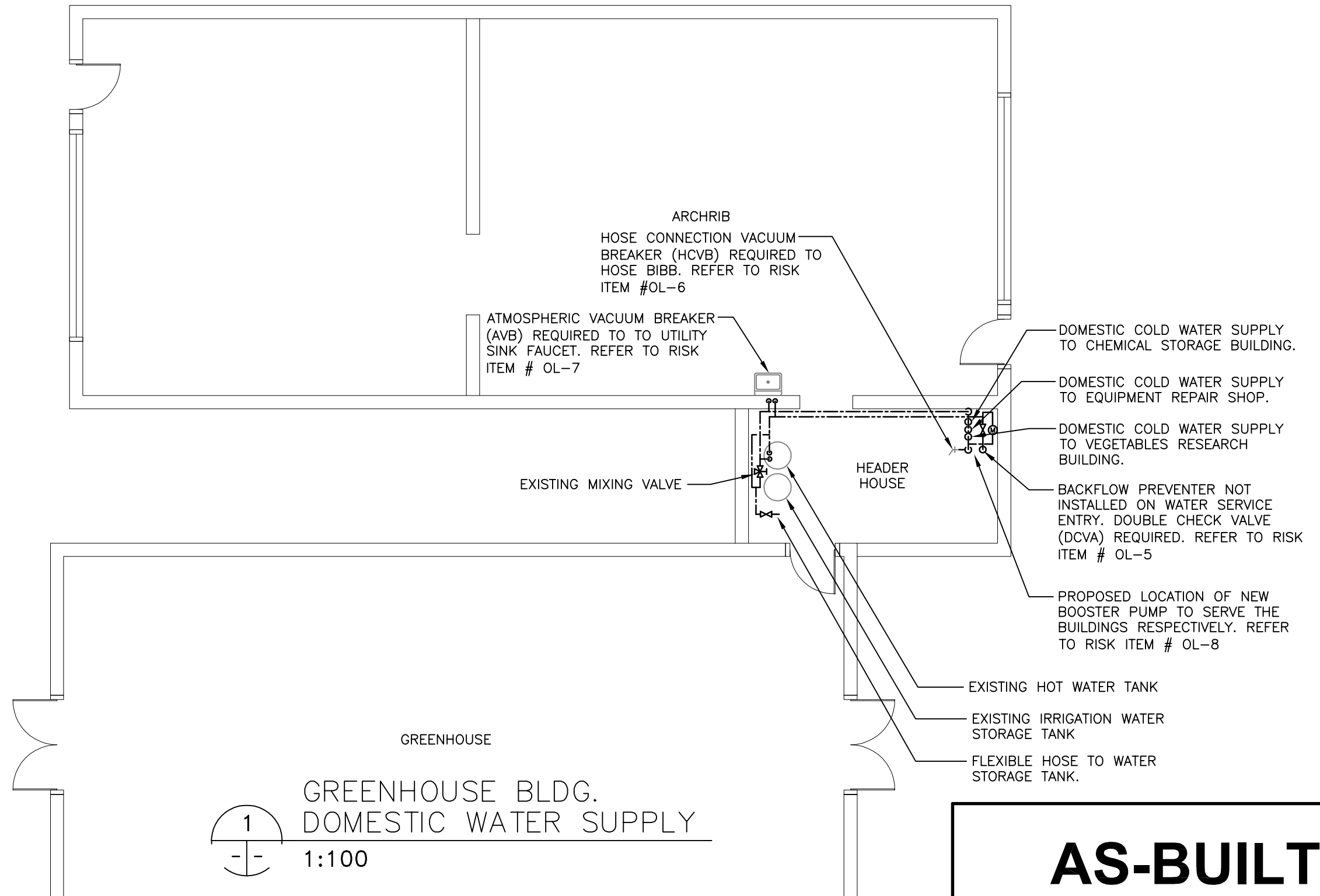
1  
- -  
EQUIPMENT REPAIR SHOP  
MEZZ. DOMESTIC WATER SUPPLY  
1:100

1  
- -  
EQUIPMENT REPAIR SHOP  
MAIN FLR. DOMESTIC WATER SUPPLY  
1:100

**AS-BUILT**

**DO NOT SCALE DRAWINGS**

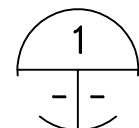
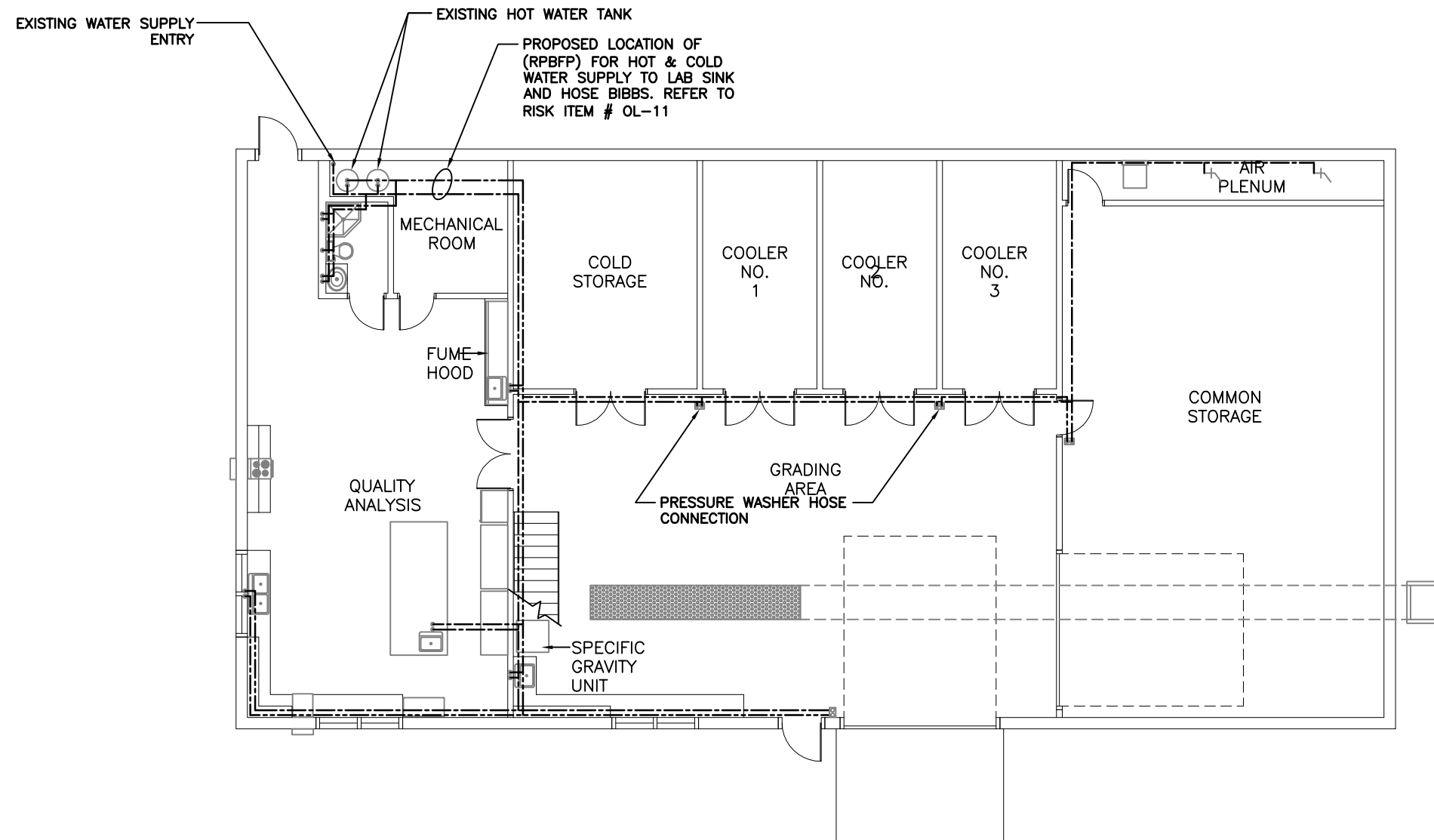
<b>Client/client</b> <b>PUBLIC WORKS GOVERNMENT SERVICE CANADA</b>  350 KING EDWARD AVENUE OTTAWA, ONTARIO	<b>Project title/Titre du projet</b> AGRICULTURAL AND ARG-FOODS CANADA SANITARY AND CROSS-CONNECTION CONTROL SURVEY  OUTLOOK, SASKATCHEWAN	<b>Drawing title/Titre du dessin</b> EQUIPMENT REPAIR SHOP BUILDING #8 DOMESTIC WATER SUPPLY AS-BUILT	<b>Approved by/Approve par</b> DH	<b>PWGC Project Manager/Administrateur de Projets TPSGC</b> Vince Rigg	<b>Project No./No. du projet</b> R.072268	
			<b>Designed by/Concept par</b> RR	<b>PWGC, Architectural and Engineering Resource Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC</b> (TO BE DETERMINED)	<b>Sheet/Feuille</b> <b>DWS 4</b>	<b>Revision/ Révision</b>
			<b>Drawn by/Dessine par</b> IS	<b>Date/Date</b> 2015-01-30	<b>DWS 4</b> OF 7	



**AS-BUILT**

**DO NOT SCALE DRAWINGS**

<b>Client/client</b> <b>PUBLIC WORKS GOVERNMENT SERVICE CANADA</b>  350 KING EDWARD AVENUE OTTAWA, ONTARIO	<b>Project title/Titre du projet</b> <b>AGRICULTURAL AND ARG-FOODS CANADA SANITARY AND CROSS-CONNECTION CONTROL SURVEY</b>  <b>OUTLOOK, SASKATCHEWAN</b>	<b>Drawing title/Titre du dessin</b> <b>GREENHOUSE BLDG. BUILDING #9 DOMESTIC WATER SUPPLY AS-BUILT</b>	<b>Approved by/Approve par</b> DH	<b>PWGSC Project Manager/Administrateur de Projets TPSGC</b> Vince Rigg	<b>Project No./No. du projet</b> R.072268	
			<b>Designed by/Concept par</b> RR	<b>PWGSC, Architectural and Engineering Resource Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC</b> (TO BE DETERMINED)	<b>Sheet/Feuille</b>  <b>DWS 5</b>	<b>Revision/ Révision</b>
			<b>Drawn by/Dessine par</b> IS	<b>Date/Date</b>  2015-01-30	<b>OF 7</b>	

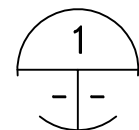
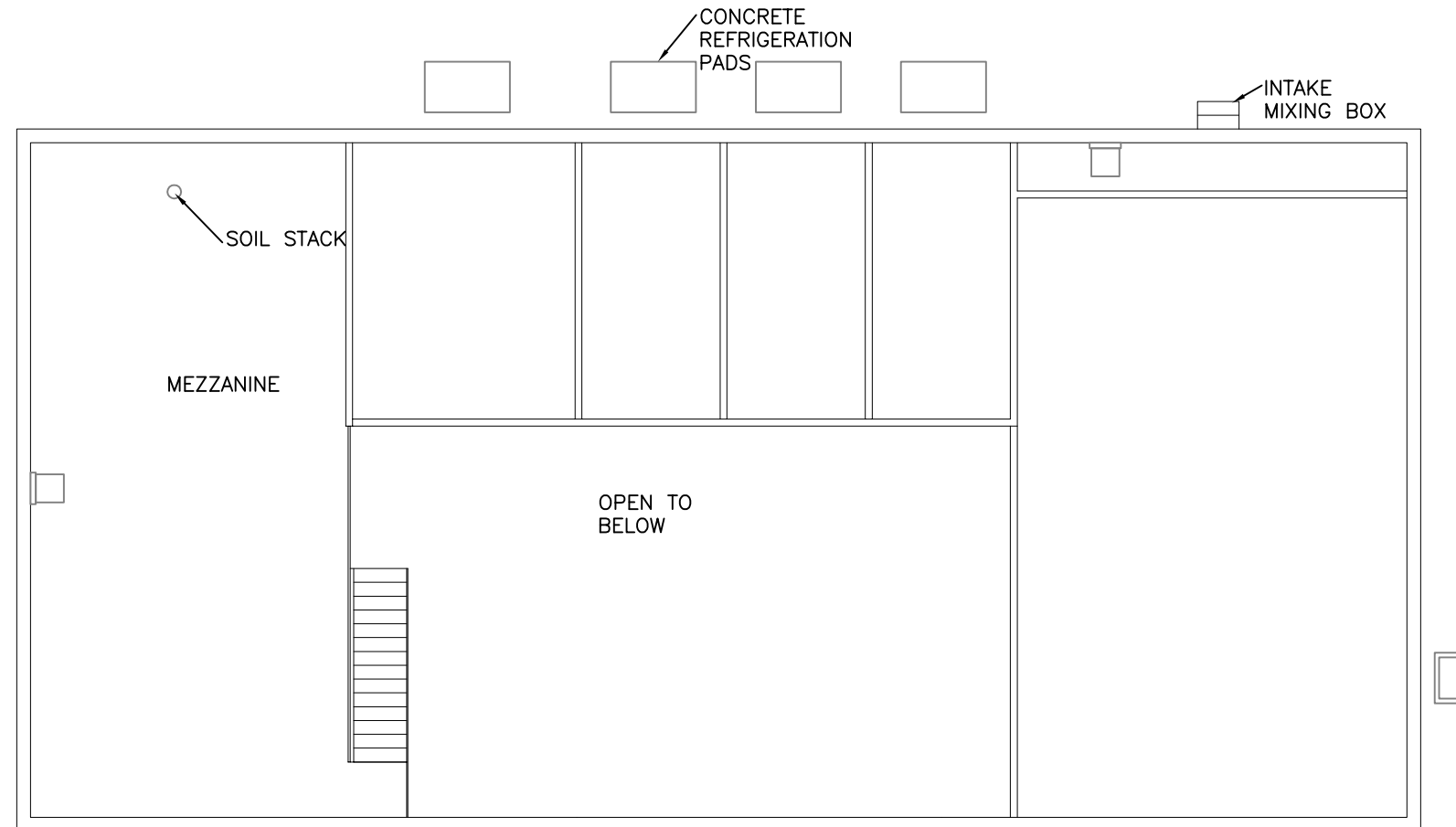


VEGETABLE RESEARCH LDG.  
MAIN FLR. DOMESTIC WATER SUPPLY  
1:150

**AS-BUILT**

**DO NOT SCALE DRAWINGS**

<b>Client/client</b> <b>PUBLIC WORKS GOVERNMENT SERVICE CANADA</b>  350 KING EDWARD AVENUE OTTAWA, ONTARIO	<b>Project title/Titre du projet</b> AGRICULTURAL AND ARG-FOODS CANADA SANITARY AND CROSS-CONNECTION CONTROL SURVEY  OUTLOOK, SASKATCHEWAN	<b>Drawing title/Titre du dessin</b> VEGETABLE RESEARCH BLDG. BUILDING #12 DOMESTIC WATER SUPPLY AS-BUILT	<b>Approved by/Approve par</b> DH	<b>PWSC Project Manager/Administrateur de Projets TPSGC</b> Vince Rigg	<b>Project No./No. du projet</b> R.072268	
			<b>Designed by/Concept par</b> RR	<b>PWSC, Architectural and Engineering Resource Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC</b> (TO BE DETERMINED)	<b>Sheet/Feuille</b> <b>DWS 6</b>	<b>Revision/ Révision</b>
			<b>Drawn by/Dessine par</b> IS	<b>Date/Date</b> 2015-01-30	<b>OF 7</b>	

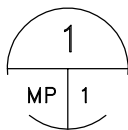
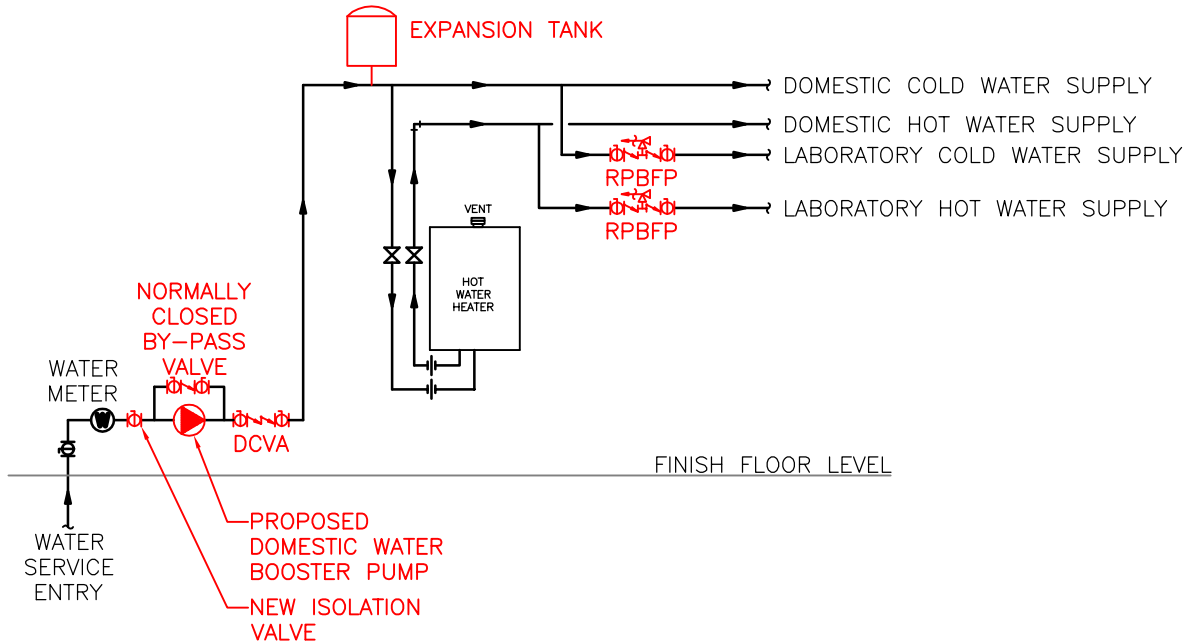


VEGETABLE RESEARCH LDG.  
MEZZANINE DOMESTIC WATER SUPPLY  
1:150

**AS-BUILT**

**DO NOT SCALE DRAWINGS**

<b>Client/client</b> <b>PUBLIC WORKS GOVERNMENT SERVICE CANADA</b>  350 KING EDWARD AVENUE OTTAWA, ONTARIO	<b>Project title/Titre du projet</b> AGRICULTURAL AND ARG-FOODS CANADA SANITARY AND CROSS-CONNECTION CONTROL SURVEY  OUTLOOK, SASKATCHEWAN	<b>Drawing title/Titre du dessin</b> VEGETABLE RESEARCH BLDG. BUILDING #12 DOMESTIC WATER SUPPLY AS-BUILT	<b>Approved by/Approve par</b> DH	<b>PWSC Project Manager/Administrateur de Projets TPSGC</b> Vince Rigg	<b>Project No./No. du projet</b> R.072268	
			<b>Designed by/Concept par</b> RR	<b>PWSC, Architectural and Engineering Resource Manager/ Ressources Architectural et de Directeur d'ingénierie, TPSGC</b> (TO BE DETERMINED)	<b>Sheet/Feuille</b> <b>DWS 7</b>	<b>Revision/ Révision</b>
			<b>Drawn by/Dessine par</b> IS	<b>Date/Date</b> 2015-01-30	<b>OF 7</b>	



ADMINISTRATIVE BUILDING #1  
BACKFLOW PREVENTION SCHEMATIC  
NOT TO SCALE

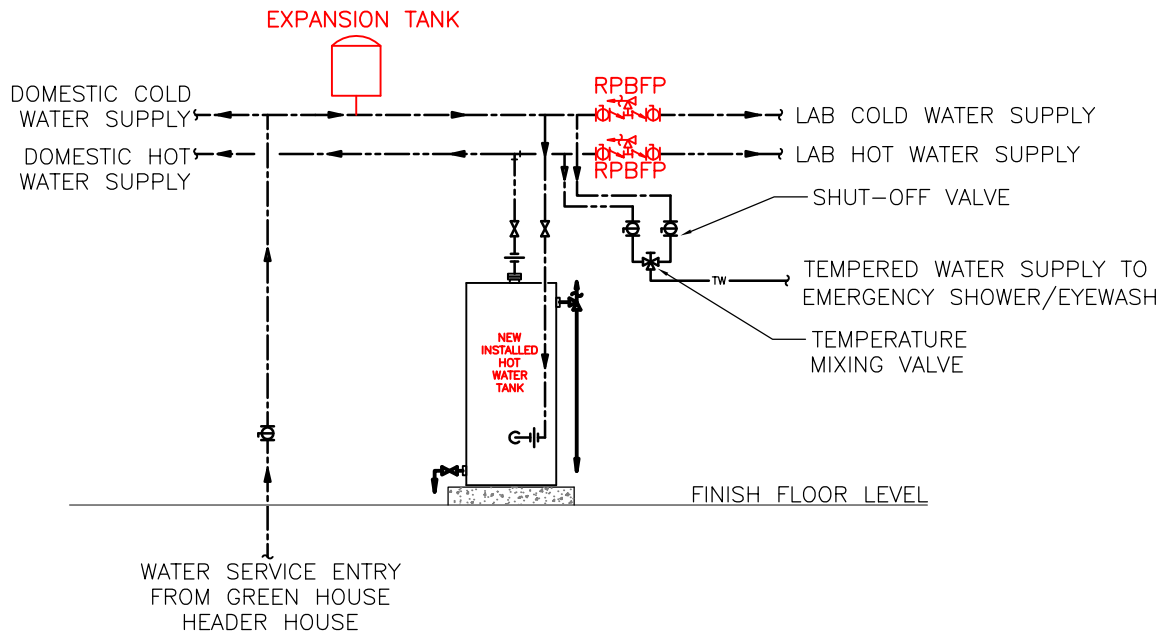
**PRELIMINARY**  
**NOT FOR CONSTRUCTION**

**DO NOT SCALE DRAWINGS**

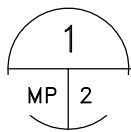
Project title/Titre du projet  
**PUBLIC WORKS GOVERNMENT SERVICE CANADA  
AGRICULTURAL AGR-FOODS CANADA  
SANITARY AND CROSS-CONNECTION CONTROL SURVEY**

Drawing title/Titre du dessin  
**ADMINISTRATIVE BUILDING #1  
BACKFLOW PREVENTION SCHEMATIC  
RECOMMENDATION**

Approved by/Approve par DH	PWGSC Project Manager/Administrateur de Projets TPSGC VINCE RIGG	Scale/Echelle NOT TO SCALE
Designed by/Concept par RR	PWGSC, Architectural and Engineering Resources Manager/ Ressources Architecturales et de Design d'Ingénierie, TPSGC (TO BE DETERMINED)	Date/Date 2015-01-30
Drawn by/Dessine par IS	Project No./No. du projet R.072268	Sheet/Feuille <b>MP-1</b>



# CHEMICAL STORAGE BUILDING #6 BACKFLOW PREVENTION SCHEMATIC



NOT TO SCALE

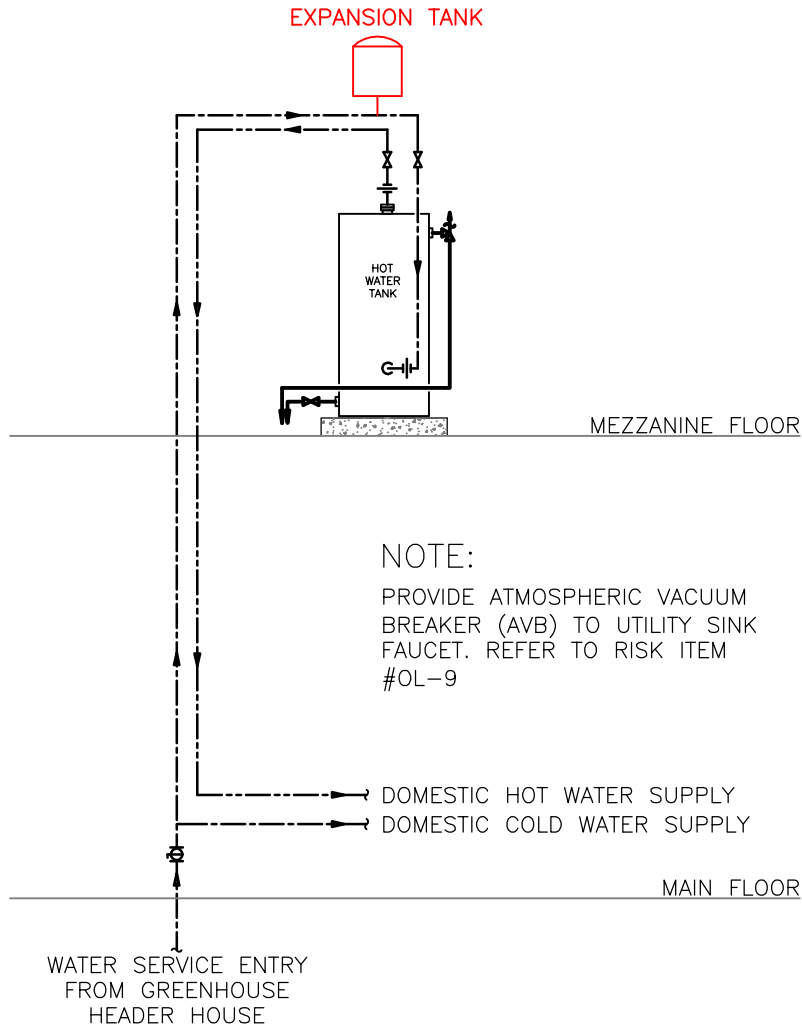
# PRELIMINARY NOT FOR CONSTRUCTION

**DO NOT SCALE DRAWINGS**

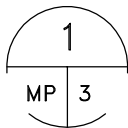
Project title/Titre du projet  
**PUBLIC WORKS GOVERNMENT SERVICE CANADA  
AGRICULTURAL AGR-FOODS CANADA  
SANITARY AND CROSS-CONNECTION CONTROL SURVEY**

Drawing title/Titre du dessin  
**CHEMICAL STORAGE BUILDING #6  
BACKFLOW PREVENTION SCHEMATIC  
RECOMMENDATION**

Approved by/Approve par DH	PWGC Project Manager/Administrateur de Projets TPSGC VINCE RIGG	Scale/Echelle NOT TO SCALE
Designed by/Concept par RR	PWGC, Architectural and Engineering Resources Manager/ Ressources Architecturales et de Design d'Ingénierie, TPSGC (TO BE DETERMINED)	Date/Date 2015-01-30
Drawn by/Dessine par IS	Project No./No. du projet R.072268	Sheet/Feuille <b>MP-2</b>
		Revision/ Revision



EQUIPMENT REPAIR SHOP BLDG. #8  
BACKFLOW PREVENTION SCHEMATIC  
NOT TO SCALE



**PRELIMINARY**  
**NOT FOR CONSTRUCTION**

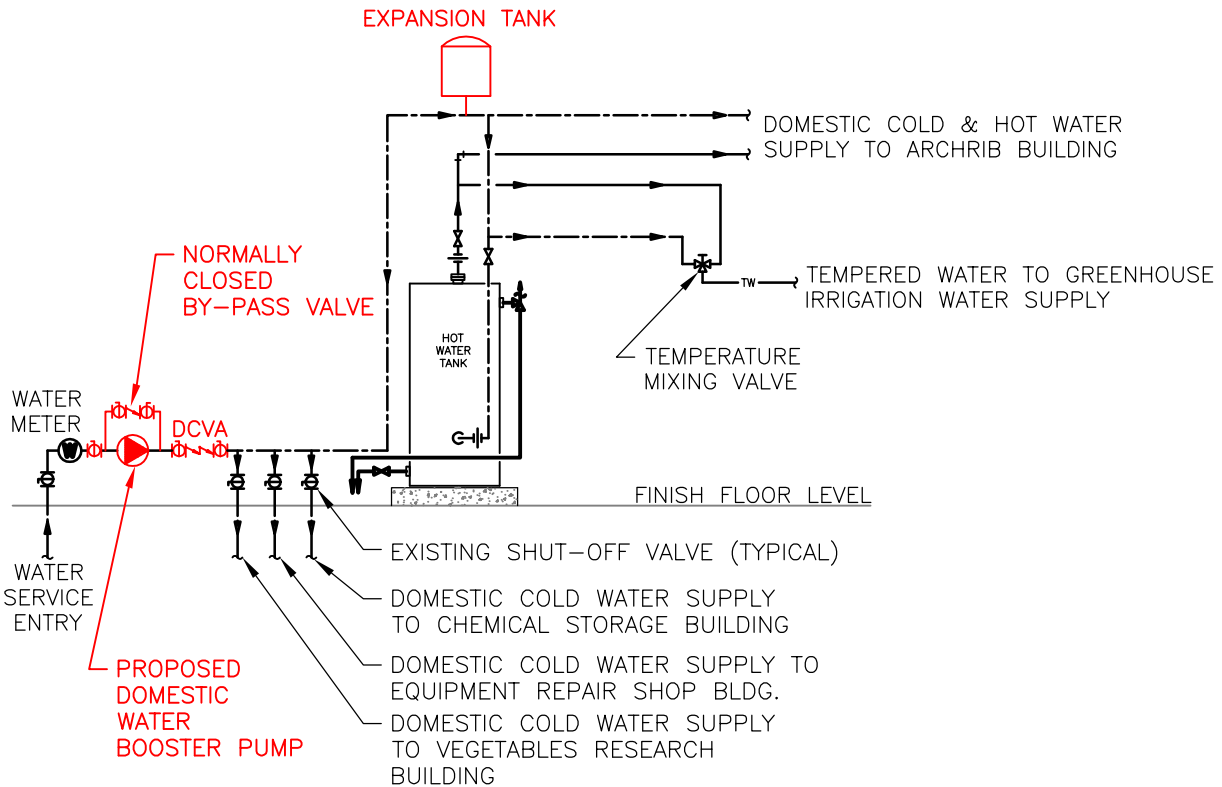
**DO NOT SCALE DRAWINGS**

**Project title/Titre du projet**  
PUBLIC WORKS GOVERNMENT SERVICE CANADA  
AGRICULTURAL AGR-FOODS CANADA  
SANITARY AND CROSS-CONNECTION CONTROL SURVEY

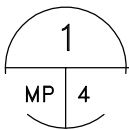
**Drawing title/Titre du dessin**  
EQUIPMENT REPAIR SHOP BLDG. #8  
BACKFLOW PREVENTION SCHEMATIC  
RECOMMENDATION

<b>Approved by/Approuvé par</b> DH	<b>PWGSC Project Manager/Administrateur de Projets TPSGC</b> VINCE RIGG	<b>Scale/Echelle</b> NOT TO SCALE
<b>Designed by/Concept par</b> RR	<b>PWGSC, Architectural and Engineering Resources Manager/ Ressources Architecturales et de Direction d'Ingénierie, TPSGC</b> (TO BE DETERMINED)	<b>Date/Date</b> 2015-01-30
<b>Drawn by/Dessiné par</b> IS	<b>Project No./No. du projet</b> R.072268	<b>Sheet/Feuille</b> MP-3
		<b>Revision/Revision</b>





GREENHOUSE HEADER HOUSE BLDG. #9  
BACKFLOW PREVENTION SCHEMATIC



NOT TO SCALE

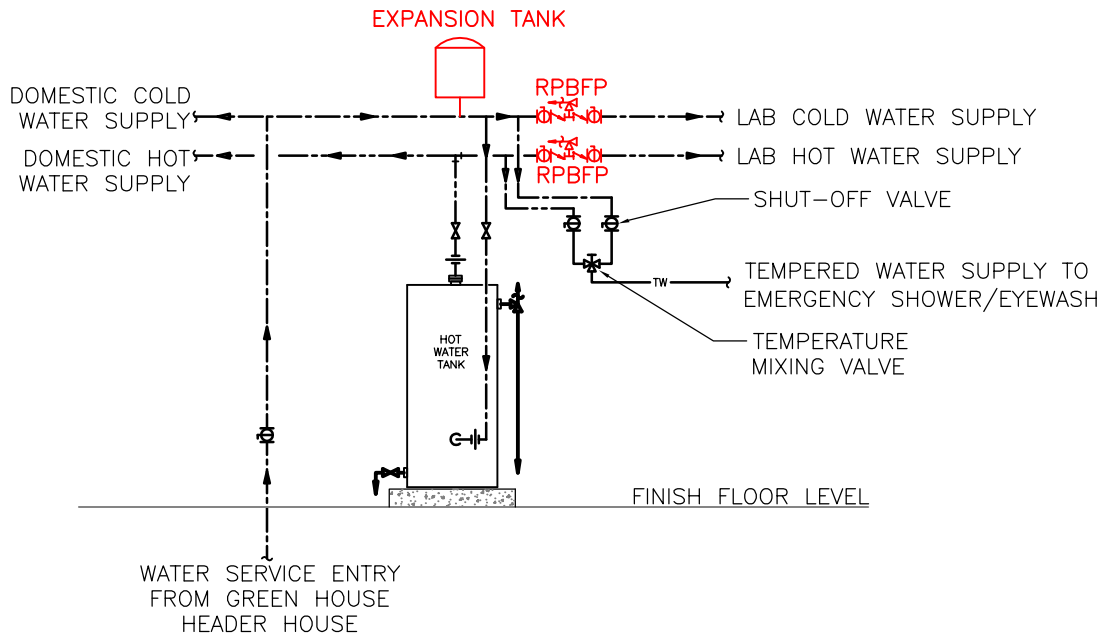
**PRELIMINARY**  
**NOT FOR CONSTRUCTION**

**DO NOT SCALE DRAWINGS**

Project title/Titre du projet  
**PUBLIC WORKS GOVERNMENT SERVICE CANADA  
AGRICULTURAL AGR-FOODS CANADA  
SANITARY AND CROSS-CONNECTION CONTROL SURVEY**

Drawing title/Titre du dessin  
**GREENHOUSE HEADER HOUSE BLDG. #9  
BACKFLOW PREVENTION SCHEMATIC  
RECOMMENDATION**

Approved by/Approuve par DH	PWGC Project Manager/Administrateur de Projets TPSGC VINCE RIGG	Scale/Echelle NOT TO SCALE
Designed by/Concept par RR	PWGC, Architectural and Engineering Resources Manager/ Ressources Architecturales et d'Ingénierie, TPSGC (TO BE DETERMINED)	Date/Date 2015-01-30
Drawn by/Dessine par IS	Project No./No. du projet R.072268	Sheet/Feuille <b>MP-4</b>
		Revision/ Revision



1  
MP 5

VEGETABLES REASEARCH BUILDING #12  
BACKFLOW PREVENTION SCHEMATIC

NOT TO SCALE

**PRELIMINARY**  
**NOT FOR CONSTRUCTION**

**DO NOT SCALE DRAWINGS**

Project title/Titre du projet  
**PUBLIC WORKS GOVERNMENT SERVICE CANADA**  
**AGRICULTURAL AGR-FOODS CANADA**  
SANITARY AND CROSS-CONNECTION CONTROL SURVEY

Drawing title/Titre du dessin  
**VEGETABLES REASEARCH BUILDING #12**  
**BACKFLOW PREVENTION SCHEMATIC**  
**RECOMMENDATION**

Approved by/Approuve par DH	PWGSC Project Manager/Administrateur de Projets TPSGC VINCE RIGG	Scale/Echelle NOT TO SCALE
Designed by/Concept par RR	PWGSC, Architectural and Engineering Resources Manager/ Ressources Architecturales et de Design d'Ingénierie, TPSGC (TO BE DETERMINED)	Date/Date 2015-01-30
Drawn by/Dessine par IS	Project No./No. du projet R.072268	Sheet/Feuille <b>MP-5</b> Revision/Revision