

## **APPENDIX A – DEFINITION OF PROFESSIONAL CONSULTANT SERVICES – ENGINEERING – PUBLIC WORKS**

# DEFINITION OF PROFESSIONAL CONSULTANT SERVICES – ENGINEERING

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## **DEFINITION OF PROFESSIONAL CONSULTANT SERVICES – ENGINEERING**

### **1. DEFINITIONS**

- 1.1 “Consulting Engineer” means the Professional Engineer or Professional Engineering firm engaged by the City to perform Consulting Engineering Services as described herein and within the Scope of Services of a Contract. The “Consulting Engineer” will hold and maintain, for the duration of the Project, a Certificate of Authorization from the Association of Professional Engineers and Geoscientists of Manitoba in the “Practicing Entity” category.
- 1.2 “Professional Engineer” means an individual engineer registered to practice in the Province of Manitoba by the Association of Professional Engineers and Geoscientists of Manitoba (APEGM), as required by the Engineering and Geoscientific Professions Act of the Province of Manitoba and the by-laws of the Association of Professional Engineers and Geoscientists of the Province of Manitoba.
- 1.3 “Professional Engineering” means the practice of professional engineering in the Province of Manitoba, as governed by the Engineering and Geoscientific Professions Act of the Province of Manitoba and the by-laws of the Association of Professional Engineers and Geoscientists of the Province of Manitoba (APEGM).
- 1.4 “Seal” means the impression of the stamp issued by APEGM to registered Professional Engineers, plus the signature of the registered Professional Engineer, plus the date the signature was applied.

### **2. INTRODUCTION**

- 2.1 Further to the General Conditions for Consultant Services, it is the intent of this Appendix to clarify the City’s specific requirements of the consulting services of Professional Engineers; to more fully identify the services to be rendered by Consulting Engineers to the City and to other parties on behalf of the City; and to provide a more clearly determined basis of obligation in respect thereof by Consulting Engineers to the City and to third parties in the provision of such services.

### **3. GENERAL REQUIREMENTS OF PROFESSIONAL ENGINEERS**

- 3.1 All services described herein shall be performed in the City of Winnipeg, unless otherwise authorized in writing by the Project Manager, and under the direct supervision of a Professional Engineer registered in the Province of Manitoba.
- 3.2 All drawings, reports, recommendations and other documents originating therefrom involving the practice of Professional Engineering shall bear the Seal of a Professional Engineer.
- 3.3 Reports and documents not involving the practice of Professional Engineering, such as letters of information, minutes of meetings, construction progress reports, may be originated and signed by other responsible personnel engaged by the Consulting Engineer and accepted by the Project Manager. Progress estimates, completion certificates and other reports related to the technical aspects of a Project, must be endorsed by the Consulting Engineer in a manner acceptable to the Project Manager.
- 3.4 None of the services, tasks, actions or requirements described herein, nor any verbal instruction from the Project Manager, are intended to relieve the construction contractor

of his contractual and/or other legal obligations in respect thereof, unless specifically indicated, in writing, by the Project Manager.

#### **4. PROFESSIONAL ENGINEERING SERVICES – ADVISORY SERVICES**

4.1 Advisory services have been referred to by the City of Winnipeg as “Type 1 Services”

4.2 Advisory services are normally not associated with or followed by preliminary design and/or design services.

4.3 Advisory services include, but are not limited to:

- (a) Expert Testimony;
- (b) Appraisals;
- (c) Valuations;
- (d) Rate structure and tariff studies;
- (e) Management services other than construction management;
- (f) Feasibility studies;
- (g) Planning studies;
- (h) Surveying and mapping;
- (i) Geotechnical investigations;
- (j) Hydrological investigations;
- (k) Safety audits;
- (l) Value engineering audits;
- (m) Inspection, testing, research, studies, or reports concerning the collection, analysis, evaluation; and
- (n) Interpretation of data and information leading to conclusions and recommendations based upon specialized engineering experience and knowledge.

#### **5. PROFESSIONAL ENGINEERING SERVICES – PRELIMINARY DESIGN**

5.1 Preliminary Design services have been referred to by the City of Winnipeg as “Type 2 Services”

5.2 Engineering services for preliminary design normally precede the detailed design of a Project.

5.3 Preliminary design services include, but are not limited to:

- (a) Preliminary engineering studies;
- (b) Engineering investigations;
- (c) Surface and subsurface site explorations, measurements, investigations, and surveys;
- (d) Operational studies including drainage studies, traffic studies, and noise attenuation;
- (e) Functional planning;
- (f) Formal and/or informal consultations with stakeholders and/or the general public

- (g) Physical, economical (capital and operating) and environmental studies including evaluation, comparison, and recommendation regarding alternative preliminary designs;
- (h) Special applications to public agencies for necessary authorizations, preparation and submission of reports and drawings thereto and appearance before same in support of the application;
- (i) Identification of the necessary authorizations from regulatory authorities and/or public agencies and determination of any related impacts and/or risks to the Project;
- (j) Coordination with all the utilities including (but not limited to) hydro, telephone, gas, telecoms, fibre optics, traffic signals and other City or developer works with respect to location, relocation, construction and/or reconstruction;
- (k) Preparation and submission of a report and appropriate drawings to the Project Manager, fully documenting data gathered, explaining adequately the assessment made, stating with clarity the resulting conclusions, and containing all recommendations which are relevant to this stage of Project implementation.

## **6. PROFESSIONAL ENGINEERING SERVICES – DETAILED DESIGN**

- 6.1 Detailed Design services have been referred to by the City of Winnipeg as “Type 3 Services”
- 6.2 Engineering services for detailed design normally involve preparation of detailed designs, construction contract specifications and drawings, analysis of bids and recommendations regarding construction contract award.
- 6.3 Detailed design services include, but are not limited to:
  - (a) Addressing alternative methods of accommodating; relocating; avoiding, and/or protecting utilities and railways; proposing alternative methods of solution, reviewing same with the appropriate regulatory approval agencies and stakeholders;
  - (b) Application to public agencies for necessary authorizations, preparation and submission of reports and drawings thereto, and appearance before same in support of the application;
  - (c) Formal and/or informal consultations with stakeholders and/or the general public;
  - (d) Preparation and submission of detailed engineering calculations, drawings, and criteria employed in the design(s), securing review of and acceptance by the Project Manager;
  - (e) Submission of engineering drawings and plans for circulation through the Underground Structures process;
  - (f) Preparation of detailed engineering drawings, specifications and bid opportunity documents consistent with the standards and guidelines of the City, securing review of and acceptance by the Project Manager;
  - (g) Preparation and provision to the Project Manager in written form, a fully detailed formal construction contract estimate;
  - (h) Provision of appropriate response to bidders and advice to the Project Manager during the bid opportunity advertising period and, subject to acceptance by the Project Manager, issuing addenda to the bid opportunity documents;

- (i) Submission of a review, analysis, comparison, tabulation, calculation, and evaluation of the bids received, to the Project Manager, including a recommendation for construction contract award;
- (j) Arranging and attending a pre-award meeting with the recommended construction contractor, the Consulting Engineer and the Project Manager;
- (k) Preparation of a report including revised contract estimate, identifying and explaining variations from the earlier formal estimate.

## **7. PROFESSIONAL ENGINEERING SERVICES – CONTRACT ADMINISTRATION**

- 7.1 Contract Administration services have been referred to by the City of Winnipeg as “Type 4 Services”
- 7.2 Engineering services for Contract Administration are associated with the construction of a Project and include the office and field services required to ensure the execution of the Project in accordance with the intent of the City and in conformance with the particulars of the drawings and specifications.
- 7.3 Engineering services for Contract Administration can be generally divided into NON-RESIDENT and RESIDENT services.
- 7.4 NON-RESIDENT Contract Administration services include but are not limited to:
  - (a) Consultation with and advice to the Project Manager during the course of construction;
  - (b) Review and acceptance of shop drawings and other submissions supplied by the construction contractor or supplier to ensure conformance with the drawings and specifications;
  - (c) Review and report to the Project Manager upon laboratory, shop and other tests conducted upon materials and/or equipment placed or installed by the construction contractor to ensure conformance with the drawings and specifications;
  - (d) Acceptance of and/or recommendations for alternate materials and methods, subject to the approval of the Project Manager;
  - (e) Provision to the Project Manager of a complete, current monthly Project status report;
  - (f) Provision to the Project Manager a current update of revised construction contract-end cost estimate on a monthly basis, or more frequently if necessary, with explanation and justification of any significant variation from the preceding construction contract-end cost projection;
  - (g) Definition and justification of any changes to the construction contract for review by the Project Manager;
  - (h) Supplying the Project Manager with a copy of all significant correspondence relating directly or indirectly to the Project, originating from or distributed to, parties external to the Consulting Engineer, immediately following receipt or dispatch;
  - (i) Provision of adequate and timely direction of field personnel by senior officers of the Consulting Engineer;
  - (j) Establishment prior to construction and submission to the Project Manager of written and photographic records of, and assessment of the physical condition of the project site and the properties, buildings, facilities, and structures adjacent to the project site sufficient to equip the Consulting Engineer to provide valid evidence and relevant testimony in settlement of any claim involving the City by

any court of law, or by any other party for damages thereto arising from the Project;

- (k) Arranging and attending pre-construction meetings and on-site or off-site review meetings, including representatives of the construction contractor, the Project Manager, and other technical stakeholders as applicable;
- (l) The preparation and submission of:
  - (i) a detailed design notes package including items such as structural, geotechnical, hydraulic and heating, air-conditioning and ventilation design calculations; mechanical and electrical design calculations related to process equipment and building services; process design calculations; and instrumentation and process control design calculations;
  - (ii) approved related shop drawings and equipment process manuals all within one (1) month of completion of each separate installation construction contract required to complete the works.

7.5 RESIDENT Contract Administration services include but are not limited to:

- (a) Provision of qualified resident personnel – acceptable to the Project Manager – present at the Project site to carry out the services as specified below:
  - (i) inspection of all pipe prior to installation;
  - (ii) inspection and acceptance of excavation for, and full time inspection at the time of bedding placement, pipe laying and backfilling in respect of installation of watermains, land drainage sewers, and wastewater sewers;
  - (iii) inspection of installation of all connections to watermains, sewers, manholes, valves, hydrants or house services, and excavation and/or exposing of all underground services, structures, or facilities;
  - (iv) inspection of all excavations to determine soil adequacy prior to installation of base and subbase courses for sidewalks, public back lanes, and street pavements;
- (b) Further to 7.5(a), full time inspection will require assignment of qualified resident personnel – acceptable to the Project Manager – to each specific location when the referenced work is being undertaken by the construction contractor:
  - (i) full time inspection and/or testing of watermains and sewers;
  - (ii) full-time inspection during pavement placement; during finishing of public sidewalks and public lanes and/or street pavements
  - (iii) full-time inspection during construction of bridge infrastructure and other structural works.
- (c) Conduct detailed inspection of construction sufficient to ensure that the construction carried out by the construction contractor conforms to the drawings and specifications;
- (d) Co-ordination and staging of all other works on the Project site including traffic signal installations, hydro, telephone, and gas utility work, railway work forces and/or other City or developer work;
- (e) With approval of the Project Manager, provision of notice to adjacent residents and businesses of those stages of construction of the Project that will interrupt public services or access thereto, sufficiently in advance of same to permit preparation therefore;
- (f) Enforcement of construction contractor conformance with the City of Winnipeg Manual of Temporary Traffic Control in Work Areas on City Streets and with reasonable standards of safety for motorists and pedestrians;

- (g) Provision of reference line and elevation to the construction contractor and checking upon the construction contractor's adherence thereto;
- (h) Representation of the City to the local residents and businesses and other inquiries in a professional manner, with responsible and prompt reaction to requests, minimizing impact and/or disruption of the Project to the extent possible;
- (i) Arranging for and carrying out of testing of materials utilized by the construction contractor to ensure conformance with the drawings and specifications;
- (j) Measurement, calculation, preparation, certification, and prompt submission of progress estimates to the Project Manager for payment to the construction contractor for construction performed in accordance with the drawings and specifications;
- (k) Arrange, attend and prepare and distribute records of and minutes for, regularly held on-site or offsite Project review meetings including representatives of the construction contractor and the City;
- (l) Promptly report any significant and unusual circumstances to the Project Manager;
- (m) Promptly arrange for and conduct a detailed final inspection of the Project with the construction contractor and the Project Manager prior to commencement of the period of contractor warranty specified in the construction contract for the Project, and providing to the Project Manager in written form an appropriate recommendation for commencement of the warranty period for the constructed or partially constructed Project;
- (n) Act as Payment Certifier and administer all construction contracts as required under the Builder's Liens Act of Manitoba;
- (o) Keep a continuous record of working days and days lost due to inclement weather during the course of construction contract works;

## **8. PROFESSIONAL ENGINEERING SERVICES – POST CONSTRUCTION SERVICES**

- 8.1 Engineering Services in the post-construction phase of a Project are associated with the completion and close-out of the Project and generally considered part of Contract Administration (Type 4) Services.
- 8.2 The Consulting Engineer is required to provide post-construction services including but not limited to:
- (a) Preparation of a Certificate of Substantial Performance in the standard City of Winnipeg format
  - (b) Preparation of a Certificate of Total Performance in the standard City of Winnipeg format
  - (c) Provision of inspection services during the warranty period of the construction contract;
  - (d) Provision of inspection services (as per 7.5(a)) for maintenance (paid) items within the warranty period of the construction contract;
  - (e) Coordination of a detailed inspection of the Project with the construction contractor and the Project Manager prior to the end of the period of construction contract warranty specified in the construction contract for the Project;
  - (f) Prompt resolution of:
    - (i) deficiencies in design
    - (ii) outstanding construction contract warranty issues

- (g) Submission of a final construction report within three (3) months of the Substantial Performance date of the construction contract, including final or projected final construction contract costs;
- (h) Provision of record drawings, within three (3) months of Substantial Performance date;
- (i) Preparation of a Certificate of Acceptance in the standard City of Winnipeg format.

## **9. PROFESSIONAL ENGINEERING SERVICES – ADDITIONAL SERVICES**

- 9.1 Additional Services have been referred to by the City of Winnipeg as “Type 5 Services”
- 9.2 Additional services are Consulting Engineering services that fall outside those described above and may or may not be associated with a construction project, but are not in place of or in substitution for those services elsewhere specified in the *Definition of Professional Consultant Services – Engineering*, with respect to other types or categories of Services.
- 9.3 Engineering Services called Additional Services include but are not limited to:
- (a) Revision of completed, or substantially completed, drawings and/or specifications that were in conformance with the original intent of the City or had been accepted by the Project Manager;
  - (b) Preparation of operating manuals and/or training of operating personnel;
  - (c) Start-up and/or operation of operating plants;
  - (d) Procurement of materials and equipment for the City;
  - (e) Preparation for and appearance in litigation on behalf of the City;
  - (f) Preparation of environmental studies and reports and presentation thereof in public hearings;
  - (g) Preparation and submission to the Project Manager, final quantities and dimensional measurements which the City requires for assessment of Local Improvement Levies within one (1) month of Project completion.