

INTEGRATED INFRASTRUCTURE SERVICES

Facility Engineering Services

Facility Planning & Design

Facility Infrastructure Delivery



Edmonton Tower
10111 - 104 Avenue
Edmonton, Alberta
T5J 0J4

Facility Design & Construction Consultant Manual

Volume 1

Design Process and Guidelines v4.0

Edmonton

Date of Issue: 2019-07-26

Contents

Contents	1
Introduction	4
Purpose and Scope	4
Definitions	5
Contact Information	5
Design Process	5
Project Communication	5
Consultant Deliverables	6
Introduction	6
Functional Programming	7
Pre-Design (Client & Technical Review)	9
Schematic Design (Client & Technical Review)	11
Design Development (Client & Technical Review)	16
Working Documents – Progress Submission (Client & Technical Review)	23
Working Documents – Pre-Bid Submission (Client & Technical Review)	29
Bid and Construction Documents	32
Drawing and Document Standards	34
References	34
Introduction	34
General	34
Standard Document Guidelines	35
Drawing Quality Guidelines	37
CAD Drawing Standards	38
Drawing Submission Requirements	39
Edmonton Design Committee	40
Design Guidelines	41
Sustainable Design	41
References	41

Minor Renovations	41
Specific LEED Credit Requirements	41
LEED Responsibilities	43
Accessibility	43
Universal Accessibility	43
General	43
References	44
Corporate Space Guidelines	44
Percent for Art Process	44
City Department Design Standards	45
Historic Resources	45
Building Life Expectancy	45
Crime Prevention through Environmental Design (CPTED)	46
North Saskatchewan River Valley Area Redevelopment Plan	47
Environmental Management (Enviso)	47
Erosion and Sedimentation Control Guidelines	48
Commissioning Guidelines	48
City Design & Construction Guidelines	48
Visual Identity Standards	49
APPENDIX A - REPORT GUIDELINES	50
General	51
Contents	51
Structure	51
Introduction	51
Executive Summary	51
Findings, Analysis, and Conclusions	52
Recommendations and Cost Estimates	52
Appendix	53
Report Presentation & Submission	53
APPENDIX B - DRAWING FILE NAMING CONVENTION	54
APPENDIX C - CONSTRUCTION COST ESTIMATES	56

APPENDIX D - SAMPLE CAD LAYERING STANDARD	59
APPENDIX E - STANDARD DOCUMENT EXAMPLES	64
General	65

1 Introduction

1.1 Purpose and Scope

- .1 This document is intended to be used for the following purposes:
 - .1 A reference for consultants providing services for new building projects and renovations to existing facilities owned or operated by the City of Edmonton.
 - .2 A resource for the City of Edmonton when reviewing and evaluating the work performed by architectural and engineering firms on City facility projects. This evaluation will follow the City of Edmonton Supplier Performance Program. Contact Corporate Procurement & Supply Services Branch or the Project Manager for details.
- .2 This document is Volume 1 of 2 and is divided into the following sections:
 - .1 Section 1 – Introduction: Establishes the scope of the document and gives general contact information.
 - .2 Section 2 – Design Process: Describes the information flow on a typical project, standard deliverables expected at each design phase and an overview of minimum document and CAD standards to be followed.
 - .3 Section 3 – Design Guidelines: Describes policies and design requirements specific to the City of Edmonton that are to be considered when designing buildings. The contents of this section may not apply to all building projects, clarify with Project Manager.
- .3 Consultant Manual - Volume 2 of 2 may be obtained from the Project Manager, and contains the following section:
 - .1 Section 4 – Technical Guidelines: Discipline specific guidelines to consider when designing buildings for the City of Edmonton.
- .4 Except where otherwise noted, the technical information contained in this document is to be used as a guide only. The consultant is expected to follow his or her professional judgment as well as all applicable codes and regulations. Building projects may have specific requirements that supersede some material presented in this document. These requirements will be communicated to the consultant at the outset of the project or during design as the need arises. When a deviation from these guidelines is either required or requested by the consultant or owner, it shall be documented in writing.
- .5 No content in either volume of this manual is designed for verbatim specification use and in general content should not be copied directly into a book spec for any project unless the consultant is explicitly so instructed. Note: this does not apply to Fire Alarm Dialer and typical security and card access details in Volume 2.
- .6 **Prior to the start of design, the Consultant will be required to sign the Acknowledgement Form provided indicating that they are aware of this manual (both Volumes, 1 & 2) and its contents. A template of the acknowledgement form is included as an appendix (Appendix E).**

1.2 Definitions

- .1 Project Manager (PM): The City of Edmonton Project Officer, Project Manager, Program Manager, or Project Engineer assigned to manage the project.
- .2 Professional Services Agreement (PSA): The contract the Consultant enters into with the City to perform the Work. This document includes the Agreement Form, Description of Work, Payment Terms, General Terms, and Additional Terms (if applicable).

1.3 Contact Information

- .1 The latest version of this document may be obtained in electronic format from the City of Edmonton [Website](#), the Project Manager or by contacting the individual below.
- .2 Consultant input to the progressive updating of this document is invited. Please direct comments to:

Supervisor, Facility Engineering
Facility Engineering Services
Business Planning & Support
Integrated Infrastructure Services
13th Floor, Edmonton Tower
10111 – 104 Avenue
Edmonton, AB T5J 0J4
bsafacilityengineering@edmonton.ca

- .3 Comments and feedback regarding CAD Drawing Standards should be directed to:

Supervisor, Facility Engineering
Facility Engineering Services
Business Planning & Support
Integrated Infrastructure Services
13th Floor, Edmonton Tower
10111 – 104 Avenue
Edmonton, AB T5J 0J4
bsafacilityengineering@edmonton.ca

2 Design Process

2.1 Project Communication

2.1.1 General

- .1 The City of Edmonton will assign a Project Manager for deliverables up to Design Development and a Project manager for Working Drawing to Post Construction. At the end of Design Development a transition will occur in which the Project manager assigned will switch as the Consultant's single point of contact within the City.

- .2 The Prime Consultant is to appoint one person to be the primary contact on the design team. If the design team consists of multiple sub-consultants in multiple firms, all official correspondence and submissions to the City of Edmonton should be through the Prime Consultant.
- .3 Any discussion between members of the design team that affects the project design, cost, or schedule should be recorded in writing by the Prime Consultant and forwarded to all relevant team members, including the Project Manager. Internal discussions between the Prime Consultant and their sub-consultants are to be documented internally. It is the responsibility of the Prime Consultant to alert the Project Manager of any internal discussions that may affect the project scope, budget, schedule, etc.
- .4 Design meeting minutes and similar documentation is the responsibility of the Prime Consultant and should be distributed to the Project Manager, sub-consultants, city-identified stakeholders and other parties as necessary.
- .5 Addendums and construction documents such as contemplated change orders, site instructions, and inspection reports are to be distributed to the Project Manager through the Prime Consultant. The Project Manager will distribute these documents to the construction contractor and/or other required parties.
- .6 The City of Edmonton uses the Google ecosystem for email, calendaring, and most documents. The Prime Consultant will make every effort to use Google for file transfers to, and developing collaborative documents with, the City of Edmonton.

2.2 Consultant Deliverables

2.2.1 Introduction

- .1 This section outlines typical deliverables at key project milestones. It is understood that all projects are different and the contents of this section may not wholly apply to all projects. For example, smaller projects may consist of reports only, or a larger project may be phased in such a way that more or less is required from the consultant at each phase.
- .2 Specific submissions required for projects are identified in the Professional Services Agreement (PSA). In addition to the deliverables identified in the PSA, it is the responsibility of the consultant to prepare any submittals required by external authorities, such as permit applications.
- .3 The consultant is responsible for ensuring they are aware of the project deliverables and preparing these submissions on time, with all required information contained therein.
- .4 The Consultant shall submit an electronic copy of all consultant deliverables, including but not limited to; design reports, drawings and specifications for the City's review and approval. Following the review and completion of any required additions or corrections the final deliverable shall be submitted via electronic PDF version. Confirm with the Project Manager if hard copies are required.
- .5 All submissions will be reviewed by City of Edmonton staff or external consultants associated with the project. This may include Project Review Team, Project Managers, City Architects, Technical Services (Facility Engineering, IT, Security), Client groups, Facility Maintenance Services, Commissioning Authority (CxA), Building Envelope Commissioning Authority (BECA),

Construction Managers/Consultants, etc. All review comments will be forwarded to the consultant by the Project Manager.

- .1 The consultant is to respond to all review comments in writing to the Project Manager prior to commencing work on the next submission.
- .2 In some cases, the consultant may be required to re-submit based on the nature of the comments.
- .3 Comments received from the City do not absolve the consultant of their responsibility to comply with all applicable codes and regulations.

2.2.2 Functional Programming

- .1 In preparing a functional program, the consultants main task is to examine the stakeholder's facility and operations in detail so as to define their needs and objectives. These requirements will establish criteria for evaluating potential design solutions or other strategic alternatives. This phase typically consists of a report explaining the guiding principles for future work, defines zones and individual spaces to be developed, the planned operational model, relationship diagrams as necessary to show working and physical relationships, the total gross area, and a construction estimate.
- .2 Should public engagement and communication material be required as part of the programming stage deliverable, material shall follow the City of Edmonton Guidelines for Visual Identity (refer to section [Visual Identity Standards](#)). All information boards, graphics and any print materials shall be "print-ready" size and graphic quality. Refer to the Professional Service Agreement for required public engagement material deliverables.
- .3 Report is to include the following:
 - .1 A written description of goals and objectives of the facility
 - .1 What is the nature and scope of the project parameters, needs and opportunities
 - .2 What information is required to develop an appropriate architectural response?
 - .2 Description of desirable activities and operations to be included, and divided into regularly occurring, seasonal, or occasional. Include interior and exterior activities.
 - .3 Description of spaces required to support those chosen activities and operations
 - .1 How much and what type of space is needed?
 - .2 What space will be needed in the future to operate efficiently and/or meet the needs of the community? Future planning to be determined on a project by project basis.
 - .3 Include any important or unique physical characteristics of these defined spaces, such as size, desired materials, acoustic properties, special lighting, ventilation, or temperature requirements, etc.
 - .4 Description of how the building will be operated and by whom, including hours of operation, maintenance, security, and shipping, building access/control, garbage and recycling and receiving requirements.
 - .5 Requirements from stakeholders including the Community.

- .6 Summary of public / stakeholder engagement and how results impacted the program.
- .7 Description of the existing site conditions, and any restrictions on how the site can be used, such as zoning restrictions, community concerns, and transportation access.
- .8 Functional adjacencies by individual space and/or by zone, depending on the building size and complexity. Suggestions for options may be required to be provided as well.
- .9 Cost sensitive items that the Design Team must respond to during the design phase, and any elements with significant impacts for funding of construction and/or operating costs.
- .10 Criteria that will govern the future planning of urban design elements, site planning, architecture, interior design, and building systems.
- .11 Summary of plans, documents, codes, standards, policies, etc. that need to be considered in the building design.
- .12 An explanation of the strategy for determining what spaces can or cannot be shared between user groups, or spaces that will have multiple uses, where applicable.
- .13 An explanation of the strategy for phasing and future expansion, where applicable.
- .14 A complete list of participants including advisory committees who were consulted during the programming process.
- .15 Include a description of assumptions around accommodating future growth.
- .16 If any risks are involved with deferring the project.
- .17 Risks related to the project.
- .4 Attachments should include, at a minimum:
 - .1 Preliminary Data sheets (unit space data) for major space types. Those room data sheets are mandatory for spaces where sizing is furniture or equipment dependent and/or there exist any extraordinary mechanical or electrical requirements. Data Sheets for all space types may be requested through a PSA amendment if it is deemed appropriate for a specific project.
 - .2 Staff and occupancy summary (table), including a description of shifts where applicable.
 - .3 Facility parking requirements (table), and staff parking requirements (table), including the amount of electrified stalls for block heaters.
 - .4 Space list spreadsheet including unit net areas and projected gross up factor, for a total area in square meters.
 - .5 Space adjacency diagrams, either for groups of spaces or for individual spaces, depending on the size of the facility.
 - .6 Lighting Control System (LCS)
- .5 This submission should include a Class 5 cost estimate (Cost/m² based). Refer to [Appendix C \(Construction Cost Estimates\)](#)
- .6 Grossing factors should be justified with an explanation of their comparative source. If the building has individual 'suites' or independent zones, then a grossing factor should be applied to each of those identified zones, and a separate grossing factor applied to the building as a whole.

- .7 Refer to Consultant Manual Volume 2, Mechanical and Electrical sections, for descriptions of space requirements for service spaces.
- .8 Where the sizes of certain building systems components can be determined during programming, include those as individual spaces rather than as part of a percentage grossing. (For example, NAR rooms, Janitor closets, and public washrooms should be itemized within the program.)
- .9 All office spaces for City of Edmonton facilities need to be programmed and sized in accordance with the Corporate Space Guidelines, as outlined in Administrative Directive A1407B: Provision of Office and Special Purpose Accommodation for Civic Staff.
- .10 The program report will become the basis for the Owner's Project Requirements (OPR), as defined by the Enhanced Commissioning Process. Refer to The [Commissioning Consultant Manual Vol. 1](#) for a template.

2.2.3 Pre-Design (Client & Technical Review)

- .1 This phase typically consists of a report with drawings or sketches as necessary to properly convey the concepts or ideas presented. The consultant shall develop a minimum of 3 design options based upon background information provided by the City. The report contains a description of solutions available, and an analysis of those solutions developed to the stage necessary to define and illustrate the viability of each.
- .2 Should public engagement and communication material be required as part of the pre-design deliverable, material shall follow the City of Edmonton Guidelines for Visual Identity (refer to the section [Visual Identity Standards](#)). All information boards, graphics and any print materials shall be "print-ready" size and graphic quality. Refer to the Professional Service Agreement for required public engagement material deliverables.
- .3 Report is to include the following:
 - .1 Programming Confirmation
 - .1 Verify the decisions made in programming. Confirm that the number and size of individual spaces, overall size, operational model, growth model, and construction estimate are still valid and accurate.
 - .2 Ensure that all of the requirements asked for during programming have been met before the design of the project is started, if for some reason the original program report was incomplete.
 - .2 Occupancy classification as per latest Alberta Building Code.
 - .3 Review of any Zoning Bylaws or other relevant codes or standards that need to be considered at project outset.
 - .4 Any variance that may be applied to the project when applying for municipal permits.
 - .5 Comments on any concerns the consultant may have regarding the background documents provided to the Consultant at project start-up, including program area size, site location, etc.
 - .6 Structural
 - .1 List of applicable codes including building importance factor

- .2 Use and occupancy loading
- .3 Environmental loading forming the basis of design
- .7 Outlines of proposed Mechanical and Electrical systems.
 - .1 Innovative Mechanical and Electrical systems should be considered.
- .8 Preliminary review of LEED requirements and discussion of sustainable design strategies.
- .4 Drawings are to include the following:
 - .1 Site design alternatives.
 - .2 Building massing studies or architectural parti diagrams.
- .5 This submission should include a Class 4 cost estimate. Refer to [Appendix C: Construction Cost Estimates](#).
- .6 This submission shall include a milestone schedule.
- .7 Confirm with the Project Manager what City-supplied information is available, such as site survey, geotechnical studies, environmental site assessments, utility and parking studies, etc.
- .8 Building Energy Modelling
 - .1 Assess the impact of up to three massing options presented by the architect, and provide feedback on the following metrics:
 - .1 Relative energy use, broken down by end uses heating, cooling, lighting and ventilation.
 - .2 Relative peak heating and cooling loads for the building and for the worst performing zones (on a W/m² or Btu/h/sq ft basis)
 - .3 Daylight potential and excessive illuminance levels (i.e. glare) in zones of interest, as determined by the City and/or Architect
 - .4 Renewable energy potential, as applicable from RFP
 - .5 Alignment of City goals as defined in the RFP (NECB energy and GHG savings, Annual Heating Demand)
 - .2 To reduce the number of variables that differentiate between each iteration of the model, plug loads, ventilation rates, and schedules (occupancy, lighting, plug, fans, thermostatic setpoints) are to be kept constant between options and are to be appropriate for the building based on occupancy.
 - .3 If mechanical systems are known at this stage, they shall be modeled directly. However, absence of mechanical information shall not hold up this phase. In lieu of actual HVAC design parameters at conceptual design, mechanical systems are to be modeled as heating, cooling, and ventilation delivered directly to the zones (i.e. 100% OA with terminal heating and cooling). The model shall also take into account the daylighting potential of the building by directly modeling the impact of daylight sensors in applicable zones. The intent of this phase is to comment only on the impact of architecture on indicative building performance metrics.
 - .4 Based on the findings from the analysis conducted above, the Building Energy Consultant will work with the architect to recommend strategies around massing, location and amount of

glazing, and shading to improve the outcome based on the metrics identified above. Allow for an additional round of energy modeling to assess the impact of resulting recommendations for only one of the massing options.

- .5 The Building Energy Consultant shall prepare a report that clearly identifies the energy modeling strategy employed, a summary of key inputs used, a summary of results based on the above metrics and any recommendations. Units shall be reported in kWh for electricity and GJ for natural gas, as well as an ekWh and ekWh/m² for total energy and GHG emissions in kg/m² as well as the annual heating demand in kWh/m². Current utility costs shall be retrieved from the City of Edmonton's Energy Management Office. GHG emissions factors shall be derived from the City's Energy Modeling Guidelines. Please include a detailed account of the calculation for annual heating demand specifically identifying all heat sources used in the calculation and how these were extracted from the energy modelling software.

2.2.4 Schematic Design (Client & Technical Review)

- .1 This phase typically consists of a report with drawings as necessary to illustrate the designs presented. This information may include detailed programming information or a Concept Design Report, if available. The report should include an estimate with a comparison to the City's construction budget. Note if no Pre-Design Report phase occurred then those deliverables shall be included at this report stage.
- .2 Should public engagement and communication material be required as part of the Schematic Design stage deliverable, material shall follow the City of Edmonton Guidelines for Visual Identity (refer to section [Visual Identity Standards](#)). All information boards, graphics and any print materials shall be "print-ready" size and graphic quality. Refer to the Professional Service Agreement for required public engagement material deliverables.
- .3 Confirm with Project Manager if this process applies to the project location. During this phase a meeting should be coordinated by the Project Manager to initiate discussions between the design team and the Edmonton Arts Council relative to the scope of the Percent for Art. This is a general discussion to develop a strategy and for planning purposes. The "Call to Artists" will only be developed when full project funding has been allocated.
- .4 Report is to include the following:
 - .1 Project background, site information, context plan, aerial photos, existing site photos, and zoning plan.
 - .2 Changes to the project as a result of Concept/Pre-Design submission, or subsequent discussions.
 - .3 Identification of design elements that deviate from the requirements discussed in this Consultant Manual (Volumes 1 and 2).
 - .4 Architectural
 - .1 Building Code summary and occupant load calculation, including a discussion on any anticipated problems and solutions.
 - .2 Zoning bylaw compliance review.

- .3 Description and elaboration of the three (3) architectural designs, including a recommendation for one of the design options. Show locations for future expansion if required.
 - .4 Written summary of how sustainability initiatives are being considered. At minimum provide:
 1. Preliminary LEED scorecard
 2. Response to items identified in LEED Responsibilities items .1 thru .14 including justification where LEED credits identified in the "[Specific LEED Credit Requirements](#)" Section may not to be pursued.
 3. Discussion on how the project will achieve the C532 Sustainable Building policy identifying means and methods of meeting the C532 policy. Consultation required on alternatives for achieving the 1% alternative energy requirement.
 4. Design is required to be ready to receive solar panels in a future project stage.
 - .5 Area and space comparison table showing deviations from site and building Functional Program requirements, and a written description of any deviations that are not 'space-based', such as project goals and objectives, etc.
 - .6 Update of any Room Data Sheets that were required in Programming Document.
 - .7 Written summary on any outcomes from meetings with; City of Edmonton development permit pre-application meeting, transportation and/or drainage departments that will be required to be incorporated into the design.
 - .8 Written summary of barrier free design for the project including elements which will be incorporated in excess of minimum Code requirements. The intent is to achieve best practices where possible indicated in the "City of Edmonton, Access Design Guide, Version 2, 2018" by City of Edmonton Accessibility Advisory Committee. Refer to section [Universal Accessibility](#).
 - .9 Written summary of effects of differential movement of slabs placed on grade, specifically potential effects on serviceability and finishes. Tolerance for Client risk should be summarized and clearly communicated. Coordinate with Geotechnical and Structural.
 - .10 Concept of building envelope to be provided.
 - .11 Provide a description on how the building envelope meets the objectives of the Owner's Project Requirements (OPR), or in the absence of an OPR, a proposed baseline for future review against. The consultant should also narrate how the configuration of building envelope and mechanical systems is the most cost effective solution to address the needs of the project.
 - .12 If applicable for the project, provide a written summary documenting any developments regarding the Percent for Art. This does not need to represent final decisions but rather it is intended to be a record of the discussion if the project is delayed pending funding allocation.
- .5 Structural

- .1 General description of the proposed foundation system based upon the provided geotechnical report.
 - .2 General description of the proposed structural system and materials to be used.
 - .3 Discussion, cost benefit analysis, and recommendation of slab on grade vs. structural slab.
 - .4 Discussion on re-use of any existing structure, complete with assumptions and limitations associated with reuse.
 - .5 Discussion on any items/issues requiring Owner direction, with advantages and disadvantages, risks, and estimated financial costs for each to allow for an informed decision to be made.
 - .6 Cost benefit analysis, with the aid of assigned Geotechnical Engineer, to determine if pile load testing is suitable.
 - .7 Discussion of predicted differential settlement for slabs placed on grade (see Architectural)
 - .8 Discussion of corrosion mitigation measures for parkades and pool systems.
 - .9 Discussion and estimated increase in cost to accommodate rooftop installed, ballasted solar panel array as described in Volume 2.
 - .10 Design is required to be ready to receive solar panels in a future project stage.
- .6 Mechanical
- .1 General description of proposed mechanical systems and fixture types.
 - .2 Discussion of systems and equipment being considered for LEED credits.
 - .3 Summary and analysis of alternative energy and energy recovery systems being considered complete with preliminary energy model and associated report detailing results from energy model. See volume 2 for additional details.
 - .4 Present approximate system-level heating, cooling and ventilation design loads in the report.
 - .5 Discussion of proposed utility services.
 - .6 Discussion of the suitability of the space allocated for mechanical systems.
 - .7 Explain how building envelope and mechanical systems being proposed are to achieve the most energy efficient building while maintaining cost effective solutions, keeping in mind the life cycle cost.
- .7 Electrical
- .1 General description of proposed electrical systems.
 - .2 Preliminary service calculation.
 - .3 Discussion of systems and equipment being considered for LEED credits.
 - .4 Discussion of proposed utility services.

- .5 Discussion of the suitability of the space allocated for electrical systems.
- .6 Description of the Security System operation including zoning (Include copy of Security Charter with submission).
- .8 Evaluation of each Mechanical and Electrical design option shall include a full life cycle¹ cost analysis comprised of:
 - .1 initial capital cost, including any required spares inventory;
 - .2 annual energy cost;
 - .3 annual maintenance costs, including any consumables;
 - .4 equipment replacement costs.
- .9 Landscape
 - .1 General description of proposed landscape design.
 - .2 Discussion of features or systems being considered for LEED (i.e. avoiding irrigation, rainwater collection, use of native species of trees, shrubs or plants)
- .5 Drawing(s) are to include the following but not limited to:
 - .1 Architectural
 - .1 Location plan, site plan, schematic floor plans, schematic building sections, conceptual envelope assembly (roof, walls, and floor), details and specific details to project
 - .2 Consultants should include more drawings or details required to explain the concept of the project.
 - .2 Structural
 - .1 Layout of foundation plans (complete with grid lines) with respect to the existing structure and/or plot of land.
 - .2 Preliminary framing plan with proposed lateral restraint locations.
 - .3 Mechanical
 - .1 Schematic drawings of major systems, locations of major equipment, exterior connections/utility connections.
 - .2 Developed schematics of the following systems:
 - 1. Heating
 - 2. Cooling
 - 3. Ventilation
 - 4. Plumbing
 - 5. Pool Systems
 - 6. Arena Refrigeration System

¹ Use 50 year time frame, a 2.5% discount rate, and show NPV for each option

7. Gas Detection

- .3 Mechanical schematics shall indicate design parameters for inlet and outlet temperatures, pressure, and flow rates where feasible.
 - .4 Mechanical room plan with major equipment positioned and service clearances shown (equipment maintenance and walking paths to access all equipment with a dolly)
 - .5 Details of any existing equipment or systems intended to be reused.
 - .6 Site plan with existing and proposed utility services.
- .4 Electrical
- .1 Location and general single-line arrangement of major distribution equipment, site generation and utility connections.
 - .2 Electrical room plan with major equipment positioned and service clearances shown.
 - .3 Details of any existing equipment or systems intended to be reused.
 - .4 Site plan with existing and proposed utility services.
 - .5 Electrical raceways between service rooms.
 - .6 Preliminary layout of Network Access Rooms to ensure adequate equipment space. Refer to [Appendix B](#) - IT Infrastructure Design Guideline for more information.
 - .7 Preliminary layout of Security and Card Access devices with intrusion zone(s) identified. Refer to [Appendix C](#) - Security and Card Access Design Guideline for more information.
- .5 Civil / Landscaping / Site Plan
- .1 Preliminary site location of building and surrounding facilities.
 - .2 Preliminary landscaping plan, including drainage and grading.
- .6 This submission shall include a Class 3 cost estimate. Refer to Appendix C: Construction Cost Estimates.
- .7 This submission shall include a detailed work breakdown schedule to implement the recommended design option.
- .8 Between the midpoint and end of Schematic Design, the Consultant will prepare a presentation for a Pre-Consultation with the Edmonton Design Committee (EDC). This meeting is not public. Refer to City of Edmonton, Edmonton Design Committee Bylaw 14054. The work includes:
- .1 A printed 11x17 color booklet to be submitted two weeks prior to the submission explaining how the project meets the committee's 'Principles of Urban Design'. Submission requirements can be found on www.edmonton.ca under "[Edmonton Design Committee](#)". Content is a draft version of the same information that will be submitted at the Formal Consultation.
 - .2 A Powerpoint presentation to be submitted the Friday before the presentation including the content of the printed booklet.
 - .3 A 15 minute presentation by the design team, followed by 45 minutes of questions and comments from the committee.

- .4 All of the above is to be prepared in advance of each deadline so that the drafts can be reviewed with the City of Edmonton Architects prior to submission.
- .5 Feedback from the committee at this stage is verbal. It is the consultant's responsibility to record the questions and comments from this discussion and determine how to address them in the next stage of work.

2.2.5 Design Development (Client & Technical Review)

- .1 This phase typically consists of a report and drawings. The consultant develops the approved option in the Schematic Design report into a submission that provides sufficient detail on how all building components are incorporated to satisfy the project requirements. Drawings are used extensively to convey all major elements and systems so the client can get an understanding of the completed building.
- .2 Should public engagement material be required as part of the Design Development stage deliverable, material shall follow the City of Edmonton Guidelines for Visual Identity (*refer to section [Visual Identity Standards](#)*). All information boards, graphics and any print materials shall be "print-ready" size and graphic quality. Refer to the Professional Service Agreement for required public engagement material deliverables.
- .3 At the beginning of Design Development, the Project Manager will re-initiate the Percent for Art Process, as described in the "[Percent for Art Process](#)" section, by arranging a meeting with the Edmonton Arts Council.
- .4 For projects with a Construction Manager engaged for pre-construction services, the CM will make recommendations to the *Owner* and the *Consultant* regarding the scope of *Work*, to facilitate the bidding and award of trade and supply contracts.
- .5 Report is to include the following:
 - .1 Changes to the project requirements as a result of the Schematic Design submission, or subsequent discussions.
 - .2 Description of the systems mentioned in previous reports, revised and expanded upon to provide a more detailed description. Unapproved options are discarded and approved alternative(s) are discussed in greater detail.
 - .3 Outline specification containing all design disciplines.
 - .4 Preliminary Design and Construction schedule.
 - .5 In consultation with City of Edmonton Facility Maintenance Representatives, a section titled, "OH&S / Work At Height" will be completed. This section shall discuss the following:
 - .1 Clearly show the intended rooftop working zone(s) on the roof plan. Refer to Vol2 Roof section for roof top work zone minimum requirements.
 - .2 Identify Confined Space and Restricted Space locations as defined by the Alberta Occupational Health and Safety Act.
 - .3 Equipment that will be placed at elevated locations (3 m or above).
 - .4 Access to elevated platforms and equipment.

- .5 Access to internal and external glazing, fixtures, and equipment requiring maintenance.
 - .6 Identify equipment and fixtures requiring mobile lifts for maintenance and repair.
 - .7 Identify equipment and fixtures requiring scaffolding for maintenance and repair.
 - .8 Rationale for proposed locations.
 - .9 Methods on controlling risks to be incorporated into the final design.
- .6 Architectural
- .1 Summary of applicable code requirements including any responses to comments raised by Authorities Having Jurisdiction (AHJ).
 - .2 Description of design features.
 - .3 Area and space comparison table showing deviations from site and building Functional Program requirements and a written description of any deviations that are not 'space-based', such as project goals and objectives, etc.
 - .4 Update of any Room Data Sheets that were required in Programming Document.
 - .5 Summary of approaches for acoustic separation/isolation for acoustically sensitive spaces.
 - .6 Summary of approaches for CPTED principles, and active building security systems
 - .7 Updated discussion of sustainability initiatives. At minimum provide:
 - 1. Updated LEED scorecard.
 - 2. Response to items identified in 3.1.4 LEED Responsibilities items .1 thru .14. Include justification where LEED credits identified in Section [Specific LEED Credit Requirements](#) may not to be pursued. Identify requirements for credits that will primarily be the City's responsibility to achieve.
 - 3. Discussion on how the project will achieve the C532 Sustainable Building Policy, identifying means and methods of meeting the C532 policy criteria for greater energy efficiency, greater greenhouse gas reduction and annual heating demand targets.
 - 4. Include comments and responses to appendix for continuity over project phases.
 - 5. Design is required to be ready to receive solar panels in a future project stage.
 - .8 Interior and Exterior Color Boards. Alternatives should be presented to the City in advance and final selections shown in the report.
 - .9 Building Code Review.
 - 1. Building Code analysis
 - 2. Fire/Smoke separations
 - 3. Exiting requirements
 - 4. Floor separation requirements
 - 5. Hazardous area locations

- .10 Written summary of barrier free design for the project including elements which will be incorporated in excess of minimum Code requirements. The intent is to achieve best practices where possible indicated in the “City of Edmonton, Access Design Guide, Version 2, 2018” by City of Edmonton Accessibility Advisory Committee. Refer to section on [Universal Accessibility](#).
 - .11 Provide description of Building Envelope systems and explanation to how it is achieving the OPR.
- .7 Structural
- .1 All loading requirements listed in General Notes, including but not limited to:
 - 1. dead load,
 - 2. use and occupancy live load, with special attention to file storage and computer server room requirements
 - 3. environmental, base snow, and rain loading will be indicated in the General Notes. Snow drift diagrams will be provided on appropriate plans.
 - 4. vehicular loading (including axle load & spacing, wheel spacing & type, and vehicle model forming the basis of design), including manlift requirements as defined in Volume 2.
 - 5. soil surcharge for below grade structure
 - 6. indicate if the backfill forming the basis of design is clay or free draining granular.
 - 7. notable and outstanding items from mechanical & electrical.
 - 8. design is required to be ready to receive solar panels in a future project stage.
 - .2 Foundation system described in detail.
 - .3 Subgrade preparation is described and finalized. Predicted movement (if slab on grade) should be identified.
 - .4 Framing system described in detail.
 - .5 Locations requiring special attention and/or unusual loading requirements described in detail.
 - .6 Confirm or discuss changes to previously made assumptions.
- .8 Mechanical
- .1 Complete description of all mechanical systems with explanation given to achieving the OPR.
 - .2 Coordinate and show all main piping, ducting, drains, sprinkler risers, sprinkler mains, and all main equipment including pumps, boilers, chillers, air handling units, condensers, cooling towers, etc.
 - .3 Descriptions of all major mechanical components and fixtures.

- .4 Details of energy recovery and environmental systems and equipment intended to be incorporated. This may include discussion of LEED concepts and energy efficiency initiatives.
- .5 Present the current system-level heating, cooling and ventilation design loads in the report.
- .9 Energy Model
 - .1 Energy model and report to be updated with all changes made since schematic design. At this stage, the Building Energy Consultant will assess the impact of the building systems listed below, in isolation and in combination, on the following metrics:
 1. Energy use, broken down by end uses (at minimum heating, cooling, lighting, plug loads, fans, and pumps)
 2. Energy Cost, broken down by end uses and Utility (including utility rates used)
 3. Peak delivered heating and cooling for the building and for the worst performing zones
 4. City compliance metrics and targets (NECB savings, LEED v4 savings, EUI, GHG emissions)
 - .2 In order to report on LEED / NECB and policy C532, a baseline building(s) shall also be completed at this stage. The City would prefer NECB baselines for LEED v4 following the Canadian ACP guidance. ASHRAE baselines may be permitted if the NECB ACP path was modelled and there is the potential for additional LEED points using the ASHRAE 90.1 baseline. If the consultant is using a software that auto-generates a baseline, the appropriate modifications must be made to ensure compliance with the NECB as it applies to the Alberta Building Code and/or LEED v4.
 - .3 Building systems to be analyzed shall include at minimum:
 1. Window performance, based on Solar Heat Gain Coefficient, Visible Transmittance, and overall U-value (including framing)
 2. Roof performance
 3. Lighting power density ranges, as appropriate, but not less than 3 levels
 4. Up to 2 mechanical system types (i.e. Air-based heating and cooling with recirculation versus 100% OA with Radiant Heating)
 5. Mechanical equipment efficiencies, including boiler efficiency, chiller and heat pump COPs, fan and pump static pressures and efficiencies, motor efficiencies, presence of heat recovery and heat recovery efficiency
 6. Impact of potential renewable energy options, as applicable in the RFP
 7. Building-type specific innovative measures (i.e. Chiller heat recovery for data centre spaces or specialized refrigeration such as ice rinks or innovative dehumidification and reheat strategies in swimming pools, etc.)
 - .4 The inputs to be used for the analysis in this phase shall be considered by the Building Energy Consultant based on previous experience with similar buildings and discussion and coordination with design team members, including the architect, mechanical and

electrical engineers. The intent of this phase is to inform design. Therefore, this exercise is intended to be an input into developing a detailed design that addresses energy as a parameter in design considerations.

- .5 For this phase, the Building Energy Consultant shall prepare a report that clearly identifies the energy modeling strategy employed, a summary of key inputs used, a summary of results based on the above metrics and any recommendations. Units shall be reported in kWh for electricity and GJ for natural gas, as well as an ekWh and ekWh/m² for total energy and GHG emissions in kg/m². Current utility costs shall be retrieved from the City of Edmonton's Energy Management Office. GHG emissions factors shall be derived from the City's Energy Modeling Guidelines.
 - .6 Consultant to provide discussion on how thermal bridging through architectural details are being addressed. Any thermal bridging through architectural details to be included in energy model.
 - .7 The Building Energy Consultant shall update the report and notify the design team on the findings of this phase and provide an update on energy performance.
- .10 Electrical
- .1 Complete description of all electrical systems with explanation given to achieving the OPR. In particular highlight reserve capacity for future growth. This includes transformer and distribution system electrical loading as well as physical space in designed equipment or for new equipment.
 - .2 Design **may be** required to be ready to implement solar photovoltaic panels, or other alternative onsite electrical production, in a future project stage or at a future point in the building life. Allow for spare panel space for tie ins and reserve physical space for associated equipment (ie. inverters, combiners, rapid shut-down devices, disconnects etc.).
 - .3 Product data sheets on all major components and luminaires.
 - .4 Discussion of LEED concepts and energy efficiency initiatives.
 - .5 Utility service, site generation and major feeder load calculations.
- .11 Landscape / Civil / Site
- .1 Complete description of landscape design strategy, including outdoor amenity spaces, parking island development, species selection, site furniture and lighting.
 - .2 Complete description of civil/site design strategy.
- .12 Environmental
- .1 Completed "Design Environmental Permit Approval Checklist". Note all outstanding items that must be determined during detailed design. Refer to "3.9 – Environmental Management (Enviso)" for more information.
- .6 Drawings are to include the following but not limited to:
- .1 Architectural

- .1 Proposed envelope assembly (roof, walls, and floor) and intended R values.
 - .2 Site Plan
 - .3 Floor plan(s), Roof plan(s), Reflected Ceiling Plan(s)
 - .4 Building cross sections
 - .5 Typical Wall Section(s) (including any typical conditions which may affect environmental separation performance)
 - .6 Interior elevations of major spaces
 - .7 Preliminary room finishes schedule
 - .8 Preliminary Doors and windows schedule
 - .9 Preliminary Furniture layout
 - .10 Exterior elevations
 - .11 Fencing, gates, outdoor patios and amenity spaces, and any other site elements shall be detailed for development permit application and Edmonton Design Committee presentation.
 - .12 Details
- .2 Structural
 - .1 Proposed general notes.
 - .2 Proposed foundation plan.
 - .3 Proposed floor framing plan (all elevations).
 - .4 Proposed wall framing plan.
 - .5 Proposed roof framing plan.
 - .6 Lateral bracing is located on plans.
- .3 Mechanical
 - .1 Mechanical site plan identifying proposed utility service connections
 - .2 Preliminary plumbing, heating and ventilation plans, showing major duct and plumbing lines
 - .3 Roof plan noting locations of drains, rooftop equipment and air intake and exhaust locations
 - .4 Mechanical room drawings shall show the items specified below:
 1. Mechanical room plans shall have a minimum scale of 1:50 with equipment, piping, ductwork and service access clearances (equipment maintenance and walking paths to access all equipment with dolly). Provide lower level and upper level plans with minimum of two (2) section views to clearly illustrate equipment heights, pipe and duct heights and clearances, vertical clearances, etc.

2. Where mechanical room drawings are modelled in three dimensions (3D), isometric views shall be shown on drawings.
- .5 Pool Design: Coordinate and show all main piping and equipment, including pumps, filters, surge tank, chemical treatment, and pool inlets and outlets
- .6 Arena Design: Coordinate and show all main piping and equipment including pumps, chillers, cooling towers, fluid coolers, etc
- .7 Developed mechanical system schematics
 1. Heating
 2. Cooling
 3. Ventilation
 4. Plumbing
 5. Pool Systems
 6. Arena Refrigeration System
 7. Gas Detection: Show all sensors, controllers, strobes, horns, etc.
- .4 Electrical
 - .1 Electrical site plan identifying type and route of power & low tension services, and location of major equipment such as utility transformers.
 - .2 Site lighting plan identifying preliminary locations of exterior luminaires. May be included on electrical site plan. Include photometric, isolux layout.
 - .3 Preliminary electrical and communication room(s) plan with major equipment (including any future planned equipment) positioned and service clearances shown
 - .4 Location and preliminary size of site generation and associated equipment (i.e. ATS, load bank, etc.)
 - .5 Preliminary Security and Card Access riser diagram. Show all intrusion zones, devices and panels both on floor plan and in tabular format. Refer to Volume 2 Appendix C - Security and Card Access Design Guidelines for more information. Preliminary security camera layout. Indicate proposed location of headend equipment.
 - .6 Typical room layout(s).
 - .7 Preliminary single line diagram. Include load calculation and expected fault levels.
 - .8 Riser diagrams for all building systems, including structured wiring (IT), security, CCTV, fire alarm, sound/public address, etc.
 - .9 Preliminary structured wiring riser diagram that clearly demonstrates all major components and their interrelation.
 - .10 Preliminary plan layouts of the Network Access Room(s) showing all major equipment.
 - .11 Illumination levels and uniformity calculations for all interior spaces; include photometric, isolux layout in drawings.

- .12 Target interior and exterior lighting power densities.
- .13 Service Drawing indicating lift path from outside through building and reviewed by a Structural Engineer for floor loading.
- .14 Lightning Protection Risk Assessment as per CSA B72.
- .5 Landscape / Civil / Site
 - .1 Landscape plan and site details as per development permit application requirements.
- .7 Provide a list of building systems requiring commissioning. The template “List of Systems to be Commissioned” may be requested from the Project Manager.
- .8 Complete the Preliminary Basis of Design document. The template “Basis of Design” document may be requested from the Project Manager.
- .9 This submission shall include a **Class 3** cost estimate. Refer to [Appendix C: Construction Cost Estimates](#).
- .10 This submission shall include an updated detailed work breakdown schedule.
- .11 Between the midpoint and end of Design Development, the Consultant will prepare a presentation for a Formal Consultation with the Edmonton Design Committee (EDC). This stage of the process is tied to the issuance of the Development Permit for the project. The requirements are the same as for the Pre-Assessment Consultation, with the following exceptions:
 - .1 The Development Permit Application is to be submitted to Sustainable Development at least one week prior to the Formal Consultation.
 - .2 The presentation content shall show how the comments from the Pre-Assessment were addressed.
 - .3 An exterior materials board shall be brought to the presentation **which remains with the committee**.
 - .4 The meeting is public.
 - .5 The committee will not give comments. They will only ask questions.
 - .6 Formal Response from the committee is given within a few days of the presentation in the form of a letter. Response will be either Non-support, Support with Conditions, or Support without Conditions. In the case of Non-Support, the deficiencies will need to be addressed in a second formal presentation to the committee. In the case of Support with Conditions, the conditions become part of the development permit response, and will need to be addressed with the development officers of Sustainable Development.

2.2.6 Working Documents – Progress Submission (Client & Technical Review)

- .1 In this phase the consultant further develops the approved Design Development submission into a complete set of in-progress drawings and specifications. This submission is reviewed to ensure the documents have incorporated all approved elements from previous submissions to the City’s satisfaction. This allows for the identification of issues at an early stage, minimizing re-work and helping to keep the project on schedule.

- .2 The use of a percentage value to describe the overall submission is discouraged. It is expected that disciplines such as civil, structural and architectural will work ahead of other disciplines to ensure information necessary to maintain the design schedule is available and not subject to significant changes.
- .3 Typically a technical review will only be completed once, at a point that provides the information requested below. Additional submissions may be requested in PSA or provided by consultant to demonstrate progress. These will not normally be subject to a technical review. Extraordinarily large projects or major design revisions may be an exception and have an extra technical review.
- .4 The Progress Submission(s) are to include the following:
 - .1 Architectural & Interior Design
 - .1 Zoning and Code summary. Fire separations are to be shown on plans and building sections.
 - .2 General notes.
 - .3 Partition Legend. Exterior and interior wall types listed.
 - .4 Site plan.
 - .5 All Plans included and are to be substantially complete. This includes floor plans, reflected ceiling plans and roof plan. All equipment and furniture locations are shown.
 - .6 Exterior Elevations, all located and drawn. Notes to be substantially complete.
 - .7 Building Sections, all located and drawn. Notes to be substantially complete.
 - .8 Wall Sections, all located and drawn. Notes to be substantially complete.
 - .9 Enlarged plans for areas such as bathrooms, kitchens, and other specialty areas, all located and drawn.
 - .10 Plan details: Typical shown. Atypical located but may not be detailed.
 - .11 Section details: Typical shown. Atypical located but may not be detailed.
 - .12 Room finishes schedule/drawing to be substantially complete. Show patterns for finishes in drawing, if applicable.
 - .13 Doors and windows schedule to be substantially complete.
 - .14 Interior Elevations, all located and drawn.
 - .15 Millwork Plans, Elevations and sections. Millwork details located but may not be complete.
 - .16 All work by other disciplines presented in this submission has been coordinated.
 - .17 Specification sections for all building assemblies should be included.
 - .18 Submission of exhaustive list of miscellaneous metal elements within the (Metal Fabrication 05 50 00) requiring fabrication. This section will be coordinated with all sub disciplines on the team.
 - .19 Reflected ceiling plan drawings should identify the locations of all equipment mounted within or concealed above finished ceiling space and should identify proposed

maintenance access locations directly on the drawing. These locations and access requirements should be coordinated with the applicable discipline drawings.

.2 Structural

- .1 General notes with project specific items added, categories not pertaining to the project deleted.
- .2 Final pile layout is set, complete with pile schedules and sections have been partially detailed.
- .3 Type of pile caps identified and sections have been partially detailed.
- .4 Grade beam schedule created and sections have been partially detailed.
- .5 Slab on grade and structural slabs created and sections have been partially detailed.
- .6 Base plate and anchor bolt schedules have been created and sections have been partially detailed.
- .7 Columns schedules created and elevations/section have been identified and partially detailed.
- .8 Framing plans are complete.
- .9 Wall elevation plans are complete.
- .10 Lateral bracing locations have been identified and partially detailed.
- .11 Sections and details have been cut and partially detailed.
- .12 Steel sections and connections that will be delegated to Structural Steel Fabricator have been identified and loading provided.
- .13 Snow load drifts identified and located on drawings.
- .14 Draft revision of all relevant specification sections. Sections may still need to be edited, but all necessary sections have been provided.

.3 Mechanical

- .1 **Mechanical Legend**
- .2 Site Plan indicating the location of storm and sanitary sewers, connections to existing sewers, pertinent inverts, size and location of water services (domestic and fire), and the location of gas services.
- .3 Roof Plan showing locations of all roof top equipment, drains, plumbing vents, air intakes and exhausts, etc.
- .4 Plans showing the location and size of all piping for storm, sanitary, cold water, hot water, circulating gas and/or fire standpipe.
- .5 Plans indicating major components of all systems, including room-by-room duct distribution, diffuser and register locations, terminal heat transfer equipment location, plumbing fixture tags, branch sprinkler piping and head locations. HVAC equipment is sized and selected.

- .6 Equipment Schedules including basic equipment design parameters to show type, configuration and service of systems with sufficient detail for structural and electrical coordination. Equipment schedules shall be located on drawings and not embedded within specifications.
- .7 Complete Schematic Diagrams, including air, steam, chilled water, condenser water, hot water, glycol, fire protection, ventilation supply, return and exhaust air.
- .8 Devices that measure air and water flow, temperature, and pressure need to be included and identified on drawings.
- .9 Schematic Diagrams for each of the systems listed below and shall be separate from the plan drawings. The diagrams are to include operating parameters including temperature and flow rates. Where parameters are variable, indicate peak design parameters and minimums. Schematic diagrams are to be developed to the system level.
 1. Heating
 2. Cooling
 3. Ventilation
 4. Plumbing
 5. Pool Systems
 6. Arena Refrigeration System
 7. Gas Detection
- .10 Riser diagrams for piping and ventilation systems for any building with four or more levels (above or below ground).
- .11 Mechanical room drawings shall show the followings:
 1. Plan layouts shall have a minimum scale of 1:50 with equipment, piping, ductwork and service access clearances (equipment maintenance and walking paths to access all equipment with dolly).
 2. Provide lower level and upper level plans with minimum of two (2) section views to clearly illustrate equipment heights, pipe and duct heights and clearances, vertical clearances etc.
 1. Layouts and elevations including duct shaft layouts and pipe routing. Include sufficient sections to show the elevations of all equipment, piping, ductwork and structural supports.
 2. Equipment service space requirements are to be shown on the drawings.
 3. Where mechanical room drawings are modelled in three dimensions (3D), isometric views shall be shown on drawings.
- .12 Gas detection plan drawing shall show locations for all sensors, controllers, strobes, horns and signage.
- .13 Proposed standard details for the project.

- .14 Draft revision of all relevant specification sections. Sections may still need to be edited, but all necessary sections have been provided. Control systems sequence of operations to be edited with a high level of detail.
 - .15 Review Owner's Project Requirements and verify recorded decisions are consistent with design intent.
 - .16 Update the Basis of Design document.
 - .17 Review and comment on the Commissioning Plan and incorporate schedule into the Design Schedule.
 - .18 Review and respond to issues identified on the Commissioning Issues & Resolutions Log.
 - .19 Review and incorporate preliminary Commissioning Specifications into Project Specifications including comments or input from CxA.
 - .20 Update energy model and report with all changes made since design development. See Volume 2 for details.
 - .21 Coordinate location and access requirements for maintenance of equipment mounted within or concealed above finished ceiling space with Architectural Consultant.
 - 1. If access panels are required, recommend minimum size, quantity, and approximate location to ensure the equipment can be accessed as per the manufacturer's recommendations.
 - 2. Large units, such as fan coils, should be aligned with finished ceiling orientation to avoid clash with regards to maintenance access and ceiling framework. Coordinate orientation with Architectural Consultant as appropriate.
- .4 Electrical
- .1 Electrical site plan indicating the location of power and low tension services, utility transformer, utility service boxes, site lighting, power, and parking pedestals.
 - .2 Lighting plan, including emergency and exit lighting. Indicate luminaire types, mounting height, and lighting control types & locations.
 - .3 Power and distribution plan, including all major equipment shown to scale, and indicating clearances in front of/around equipment. Indicate all site generation including emergency/standby power system (if applicable).
 - .4 Low tension system plan(s), including fire alarm, structured wiring, sound. If necessary to increase clarity, separate low tension systems on different drawings.
 - .5 Provide elevations for equipment installed in Electrical Room(s) and Network Access Rooms (NARs), including backboards and free-standing racks. Show all major equipment, equipment mounted to backboards, grounding, and receptacles.
 - .6 Security and Card Access system drawings indicating location of all devices, raceways, panel(s) and zoning.
 - .7 Video Surveillance system drawings indicating location of all devices, raceways, head-end equipment and view angles.

- .8 Single-line diagram. Include interrupting rating of panels.
 - .9 Riser diagrams for all electrical systems, including fire alarm, sound system(s), security, low voltage/lighting controls, and structured wiring.
 - .10 Electrical details, including utility transformer installation details, trenching/underground installations, equipment installation details, grounding/bonding details, and control diagrams.
 - .11 Preliminary panel schedules. Final circuiting is not required in this submission.
 - .12 Luminaire schedule.
 - .13 Preliminary low voltage panel schedules.
 - .14 Preliminary motor schedule, coordinated to the same progress level as the mechanical submission.
 - .15 Equipment schedule for all hard-wired electrical equipment and electrical equipment with a dedicated receptacle served by a branch circuit greater than 120V, 20A, 1ph.
 - .16 Working specification, edited to include only those products and methods applicable to the project.
 - .17 Schedules may appear in either the drawings or specifications.
 - .18 Review Owner's Project Requirements and verify recorded decisions are consistent with design intent.
 - .19 Update the Basis of Design document.
 - .20 Review and comment on the Commissioning Plan and incorporate schedule into the Design Schedule.
 - .21 Review and respond to issues identified on the Commissioning Issues & Resolutions Log.
 - .22 Review and incorporate preliminary Commissioning Specifications into Project Specifications including comments and input from CxA when available.
- .5 Landscape / Civil / Site
- .1 Site Plan, indicating major grade elevations, land contours, material and dimensioned locations of primary site features.
 - .2 Builders Pavement Plan
 - .3 Planting Plan
 - .4 Site Materials Plan
 - .5 Details of key site design elements
 - .6 Site Demolition and Removals Plan
 - .7 Site Grading and Storm Drainage Plan
 - .8 Site Lighting and Site Electrical Plan (or coordinate with Electrical design)
 - .9 Site Irrigation Plan

- .10 Utility Connections Plan and Municipal Improvement Agreement (MIA) coordination (where required).
- .6 Work at Height Plan
 - .1 The Consultant shall provide a drawing(s) titled “Work At Height Plan”. The drawing(s) will depict the following:
 - 1. All falling risk zones.
 - 2. Location of rooftop equipment, including clearance envelope deemed necessary to maintain equipment.
 - 3. Location of access points, roof hatches, fixed ladders, ladder guides, etc.
 - 4. Location of guard rails, travel restraint, and fall arrest anchors.
 - 5. Locations of signage.
 - .2 The “Work at Height Plan” will be a coordinated effort of the Consulting Team and representatives of the City of Edmonton Facility Maintenance Team.
 - .3 Work to be completed at height, at a minimum, will be governed by the current version of the Alberta Occupational Health and Safety Act and the associated OHS Code Explanation Guide.
 - .4 Operation and maintenance of equipment will be considered when determining the location of said equipment.
 - .5 The result of this effort is the minimization of exposure to the risks of falling by:
 - 1. Eliminating risk by placing equipment at grade or within dedicated rooms.
 - 2. Placing equipment in locations not requiring guardrails, travel restraint, or fall arrest equipment.
 - 3. Understanding that the use of travel restraint and rooftop anchors will only be considered if all other methods of risk management have been determined to be impossible.
- .7 Energy Modelling
 - .1 Building Energy Consultant to review drawings and specifications and update model and associated energy report with any changes
 - .2 For Building Permit, the Building Energy Consultant shall provide all documentation required by The City of Edmonton, Inspections and Permits.
- .8 This submission should include a **Class 2** cost estimate. Refer to [Appendix C: Construction Cost Estimates](#).

2.2.7 Working Documents – Pre-Bid Submission (Client & Technical Review)

- .1 In this phase the consultant prepares a complete set of drawings and specifications intended to convey all information necessary to allow a contractor to bid and construct the project. These documents must be in compliance with applicable codes and be based on the latest approved design submission and estimate of construction cost. The information contained in the Pre-bid

submission is to be 100% complete with no further work intended, and is submitted to allow the City a final chance to review progress and ensure all requirements have been included.

- .2 The construction specification containing all technical sections should be coordinated with the City's Front-End specification to ensure section names and numbers are correctly cross-referenced, information is not duplicated, and there is no contradictory information.
- .3 The Pre-Bid Submission is to include the following:
 - .1 Architectural & Interior Design
 - .1 All items in previous submission, and any outstanding items, 100% complete, with comments from previous submissions addressed.
 - .2 Complete all schedules, including door, frame, hardware, glazing, and interior finishes.
 - .3 All user equipment should be clearly identified as either In Contract, Not in Contract and Installed by Contractor, or Installed by Others.
 - .4 All coordination with other disciplines is 100% complete.
 - .2 Structural
 - .1 All items in previous submission, 100% complete, with comments from previous submissions addressed.
 - .2 General notes are edited and are project specific. All extraneous and non-applicable notes have been removed.
 - .3 All schedules are 100% complete.
 - .4 All specifications are 100% complete.
 - .3 Mechanical
 - .1 All items in previous submission, 100% complete, with comments from previous submissions addressed.
 - .2 General notes are edited and project specific.
 - .3 Site plan is complete, with gas load table provided.
 - .4 Roof plan with all equipment, duct and pipe penetrations noted.
 - .5 Equipment tags complete on all drawings.
 - .6 All piping and duct drawings complete with detail connections and all sizes noted.
 - .7 Fire protection plan completed.
 - .8 Schematic drawings and separate plan drawings for each of the systems listed below. The diagrams shall be complete with all instrumentation, Building Automation System (BAS) tags, design operating parameters (flow rate, temperature, pressure, etc.), equipment tags, dampers, valves, and other specialties. The schematic diagrams shall be developed to a system level
 1. Heating

2. Cooling
 3. Ventilation
 4. Plumbing
 5. Pool Systems
 6. Arena Refrigeration System
 7. Gas Detection
- .9 Equipment, components, piping and ductwork arranged to accurately reflect the physical (on-site) configuration including equipment connections, valves and dampers.
 - .10 Riser diagrams for piping and ventilation systems for any building with four or more levels (above or below ground).
 - .11 Standard details edited and project specific.
 - .12 Equipment schedules completed.
 - .13 List of BAS Control points has been included, complete with input/output type.
 - .14 Mechanical drawings shall show the items specified below:
 1. Mechanical room plan shall have a minimum scale of 1:50 with equipment, piping, ductworks and service access clearances shown (equipment maintenance and walking paths to access all equipment with dolly).
 2. Provide lower and upper level plans with minimum of two (2) section views to clearly illustrate equipment heights, pipe and duct heights and clearances, vertical clearances, etc.
 3. Where mechanical room drawings are modelled in three dimensions (3D), isometric views shall be shown on drawings.
 4. Full coordination of mechanical details with architectural, civil, structural, and electrical design elements must be clearly identified.
 - .15 Review Owner's Project Requirements and verify recorded decisions are consistent with the design intent.
 - .16 Update the Basis of Design document.
 - .17 Review and comment on the Commissioning Plan and incorporate schedule into the Design Schedule.
 - .18 Review and respond to issues raised on the Commissioning Issues & Resolutions Log.
 - .19 Review and incorporate final Commissioning Specifications into Project Specifications.
 - .20 Energy model update and report update with any changes since progress submission. See Volume 2 for more details.
- .4 Electrical

- .1 All items in previous submission, 100% complete, with comments from previous submissions addressed.
 - .2 Complete circuiting of all devices.
 - .3 Completed panel schedules indicating connected load, total connected load per phase, and total panel load.
 - .4 Completed motor schedule, 100% coordinated with final mechanical documents.
 - .5 Review Owner's Project Requirements and verify recorded decisions are consistent with design intent.
 - .6 Update the Basis of Design document.
 - .7 Review and comment on the Commissioning Plan and incorporate schedule into the Design Schedule.
 - .8 Review and respond to issues raised on the Commissioning Issues & Resolutions Log.
 - .9 Review and incorporate final Commissioning Specifications into Project Specifications.
 - .10 Provide complete Preliminary Arc Flash & Coordination Study as per Appendix E of Vol 2
- .5 Landscape / Civil / Site
- .1 All items in previous submission, 100% complete, with comments from previous submissions addressed.
 - .2 Final documents for Municipal Improvement Agreement (MIA) utility connections or roadway work, submitted for City approval (if required).
- .6 Environmental
- .1 Final "Design Environmental Permit Approval Checklist", incorporating all outstanding items from the Design Development submission. This checklist is for the City's records is not required to be included in the bid documentation. Refer to "3.9 – Environmental Management (Enviso)" for more information.
- .4 The Pre-Bid submission should include a Class 1 cost estimate. Refer to Appendix C: Construction Cost Estimates.
- .5 Note: Responding to reviews done by COE will not relieve consultants to provide COE 100% complete set of drawings and specifications for competitive bidding process. The Construction documents should be complete in all respects for general contractor to price it accurately and in a timely manner.

2.2.8 Bid and Construction Documents

- .1 The Bid documents are to consist of a complete set of drawings and specifications intended to convey all information necessary to allow a contractor to bid and construct the project. These documents must be in compliance with applicable codes and shall incorporate all review comments from the Pre-bid review.
- .2 The Consultant shall, when describing products and processes, use terms that are standard in the industry and are consistent between the drawings and specifications.

- .3 The Consultant shall advise the City of any adjustments to previous estimates of Construction cost and schedule due to changes in requirements or general market conditions.
- .4 The Consultant shall obtain contract document sign-off by the City prior to the contract documents being issued for bids.
- .5 The Consultant shall ensure that all disciplines sign, seal and date all drawings and the specification title page prior to the contract documents being issued for Bids.
- .6 The Consultant shall provide the City with an electronic copy of the specifications and drawings in PDF format for bidding purposes, with files arranged and bookmarked as directed by the City, for purposes of electronic posting. The City will electronically distribute the Bid documents via posting on SAP Ariba.
- .7 Bid drawings are to be stamped and signed by the professional responsible for the design.
- .8 "Issued for Construction" documents are required when indicated in the PSA, or when significant changes to the bid documents are made by addendum during the bidding process. "Issued for Construction" documents are to incorporate all addenda and revision items up to the date of issue.
- .9 Energy Model update and report with any changes since Pre-Bid submission.
 - .1 Upon completion of final construction documents (i.e. Issued For Construction drawings and specifications), the Building Energy Consultant shall prepare an energy model for the purposes of LEED and all supporting documentation as required by the governing authority of the LEED program. The Building Energy Consultant will also respond to review comments by the governing authority to ensure successful achievement of the Energy and Atmosphere Prerequisite 2 Minimum Energy Performance and Credit 1 Optimize Energy Performance.
 - .2 It is expected that the Building Energy Consultant clearly communicate to the Prime Consultant and/or the design professionals reviewing shop drawings on what criteria should be reviewed and when and how the Building Energy Consultant should be notified of any relevant changes.
 - .3 At the time of occupancy permit and schedule B and C submission, the energy model is to be updated with any changes that occurred during construction including any changes to equipment efficiency that occurred during the shop drawing process. The results of this model to be used to support the City of Edmonton NECB compliance requirements.
 - .4 A final as-built energy model, reflecting all of the changes from the compliance model to the construction of the building shall be captured in a final energy model that may be used for post-occupancy verification of energy savings at a later date. As close as possible match this model to the actual weather, infiltration, occupancy, plug loads and thermal bridging etc. regardless of NECB requirements. Coordinate with design professionals to account for any changes to equipment efficiency during the shop drawing process. After this model is complete please update the associated report and send to City Project Manager.
 - .5 All reports, discussion summaries, meeting minutes, and modeling files will be provided to The City of Edmonton's Project Manager.

2.3 Drawing and Document Standards

2.3.1 References

- .1 *Responsibilities for Engineering Services for Building Projects, V1.2*, APEGA, March 2009. This document can be downloaded from the APEGA Website.

2.3.2 Introduction

- .1 The drawing standards outlined in the "[CAD Drawing Standards](#)" section are to be followed for all projects.
- .2 Further to the contents of the "[CAD Drawing Standards](#)", the basic guidelines presented in this section should be followed when preparing reports, drawings, specifications or other documents for the City of Edmonton.

2.3.3 General

- .1 Follow a consistent format throughout. Where information for a submission is provided by multiple sub-consultants, it is to be incorporated into a single document that follows the same format throughout. This includes header/footer, title block, font size and type.
- .2 Bid documents are to clearly identify the entire scope of work to allow bidders to bid accurately.
 - .1 Coordinate with the Project Manager to include provisions for alternate pricing where building conditions affecting scope aren't known when the Bid documents are produced. Alternate pricing will not be allowed in situations where an inspection of the existing building, as-built drawings, or Operation and Maintenance manuals would clarify any unknowns.
 - .2 When modifying existing equipment or adding onto an existing building system, provide all necessary details on the existing equipment required for the bidders to accurately assess the cost. Include model name, number, vendor information, etc as appropriate.
 - .3 Drawings should generally be produced in monochrome format, with legible line types, so that the information can be legible when reproduced by a black and white printer/plotter. While photos are generally discouraged, if they are used in a drawing any photos should be high quality grayscale or colour and must print out clearly in both black and white and colour.
- .3 Wording in documents that provide direction to the Contractor (i.e. specifications, drawings, site instructions) is to be directed to the general contractor, and not distinguish between subcontractors. It is the responsibility of the general contractor to manage his own forces as necessary.
- .4 Perform an internal peer review prior to submittal to the City.
 - .1 Coordinate all submission materials between disciplines.
 - .2 Compare the submission to the most recent approved design report and all subsequent design documentation to ensure compliance with City of Edmonton's requirements. Ensure comments received from the City from previous submittals are addressed in the current submission.

- .3 Proof-read for spelling, grammatical errors and readability. It is recommended that this be performed by an individual not involved in writing or producing the document.

2.3.4 Standard Document Guidelines

.1 Reports and Studies

- .1 Architectural and Engineering reports and studies are to comply with the guidelines set out in [Appendix A –Report Guidelines](#). Examples of reports where these requirements apply are feasibility studies, condition assessments, incident investigations, energy assessments, etc.

.2 Specifications

- .1 Unless specifically allowed by the City on a project, specifications on drawings are not permitted. All specifications are to be in latest adopted edition of MasterFormat™ (50 Divisions). Under no circumstances can specification material appear in both the drawings and specification book, even if this information pertains to different sections or divisions.
- .2 The City will provide a draft copy of Division 00 and 01 front-end specification for coordination purposes. Ensure duplicate or conflicting information between frontend and technical specifications is eliminated. Specific attention should be given to coordinating Allowances, Separate & Alternate Pricing, Submittals (shop drawings, samples, mock-ups, O&M manuals, as-built drawings, etc.), Training, Testing and Commissioning requirements.
- .3 Use the same formatting as the City front-end specification. This includes the header, font size and type, numbering and formatting conventions. Font shall be Arial, 11 pt.
- .4 The final specification is to be submitted in PDF format on optical disc, memory stick, portable drive, or via file sharing system. The PDF specification is to contain all sections in one document, with individual sections bookmarked and to be fully text searchable/OCR'd.
- .5 Do not include consultant fees to perform additional services for the contractor in the specification if these services are already included in the Consultant's contract with the City, or if these services are to be performed by a third party. I.e. CAD record drawing preparation from as-built markups or witnessing of fire alarm verification.
- .6 Wherever possible, provide a performance specification or three (3) acceptable products in the specification product sections. If there are not three acceptable products, use "or acceptable alternates", and coordinate with instructions to bidders to allow alternates to be proposed during the bid period.

.3 Addenda

- .1 All Requests For Information (RFI's) that may result in issuing of addendum should be issued by consultant in 48 working hours or a timeline agreed upon with the COE PM.
- .2 Prior to issuing an addendum, the Prime Consultant is to obtain the current addendum number from the Project Manager. All addendum documents are to include this number.
- .3 Each addendum item should make reference to a specific drawing detail, drawing note, or specification article in the contract documents.
- .4 Each addendum item should indicate whether the item referenced is to be added, deleted, or revised, with further clarification(s) as required.

- .5 Include sketches with addenda, where necessary. Sketches issued with addenda are to be incorporated into the construction drawing set.
 - .6 Use the City's addendum format for all addenda. A copy of the City's addendum format in Word may be requested from the Project Manager. An example of an Addendum using the City's format is included in the appendices.
 - .7 Addenda that do not follow these requirements will be returned for resubmittal.
- .4 Submittals Registry
 - .1 Prepare a submittals registry prior to construction start-up, to be handed over to the Prime Contractor.
 - .2 This registry is to include a list of all submittals (bid submittals, shop drawings, samples, mock-ups, O&M materials, etc) to be submitted by the Contractor. Include reference to the specification section where the item is described.
 - .5 Site Instructions, Contemplated Change Orders, Change Orders and Change Directives
 - .1 The City will issue all Site Instructions, Contemplated Change Orders, Change Orders and Change Directives to the Contractor.
 - .2 The use of electronic contract administration programs to monitor and issue SIs, CCOs, CO's and CD's is permitted, providing the requirements of this section are adhered to. Prior to implementation, get approval from the Project Manager.
 - .6 Meeting Minutes
 - .1 Record and distribute minutes for project (design and construction) meetings, as required on a project by project basis and defined in the service agreement.
 - .2 Include list of attendees with contact information, location and time of meeting.
 - .3 Meeting minutes are to include all outstanding items carried forward from previous meetings and any updates discussed in subsequent meetings. All unresolved items noted in the minutes are to be assigned to a responsible party.
 - .4 Minutes are to be distributed within 5 business days of the meeting or faster if the minutes contain time-sensitive information.
 - .7 Field Reviews Reports
 - .1 Include date, time, weather conditions, person(s) performing inspection, date of previous review.
 - .2 Indicate system(s) being reviewed.
 - .3 Note the reason for review (progress, rough-in, substantial completion, warranty, etc).
 - .4 Give a description of construction progress, as it relates to the system(s) being reviewed. Indicate progress since previous review.
 - .5 Note specific deficiencies and action items. Include description of item, relevant background information, and party(s) responsible for next steps.
 - .6 Record details of any discussions held on site between consultant and contractor, client, etc.

- .7 Field review Reports are NOT a substitute for a Site Instruction or Contemplated Change Order. Issues identified during inspections are to be followed up with SIs or CCOs as required.
- .8 Field review reports are to be distributed within 3 business days of the date of inspection. Time sensitive inspection items are to be addressed verbally to the Project Manager at the time of inspection.

2.3.5 Drawing Quality Guidelines

- .1 Drawings are to comply with APEGA guideline “Responsibilities of Engineering Services for Building Projects”, with specific attention paid to Appendixes B through G of that document.
- .2 Clarity of submitted drawings is of paramount importance. Submissions will be reviewed to ensure they meet the project requirements and clearly convey the entire scope of work to bidders. Submissions not meeting these criteria will be returned for resubmittal.
- .3 The following are suggestions to help minimize errors and increase the clarity of drawings:
 - .1 Utilize the same floor/room names, numbers, gridlines, etc on entire drawing set, including sub-disciplines.
 - .1 City of Edmonton Facility Inventory Management (CAFIM) group shall be contacted to secure approved floor naming and room numbering scheme; email “fim@edmonton.ca” or “cafim@edmonton.ca”.
 - .2 To minimize errors where a change is made on one drawing but not on the others, do not duplicate specific information on multiple sheets or details. For example, while the electrical service feeder will be drawn physically on the electrical site plan and schematically on the single line diagram, the specific cable and conduit size should be written on only one of those details with a keynote on the other detail(s) referring the reader where to find the information.
 - .3 Include a key plan for drawings containing a partial floor plan.
 - .4 Notes and Legends:
 - .1 Place notes, legends, and frequently referenced details on the right side of the drawing, or opposite the side on which the drawing set will be bound.
 - .2 Place general notes and legends on the first drawing sheet for each discipline, or on each drawing in the set. If general notes and legends are placed on each drawing, include only those notes and symbols that apply to that drawing.
 - .3 Use general notes for information that applies to the entire drawing or group of drawings.
 - .4 Text notes should be preferentially used for plans and details. When the amount of description or number of notes suggests the use of callouts and keynotes for clarity, the list of keynotes shall be sheet or detail specific and complete. That list shall include all callouts, and only those callouts, relevant to that sheet or detail. Each keynote must be referenced by a consistent callout symbol and numbering system specific to that sheet or detail. Skipped numbers, “note not used”, and unreferenced or unmatched callouts-keynotes links are unacceptable.

- .5 When using standard details or drawing templates, delete all notes that do not apply to the specific project.
- .6 Keep notes on drawings concise and specific. Do not include notes when the same information is explained graphically in a plan or detail.
- .5 Separate densely-packed information into multiple drawings to improve readability. For example, separate different building systems onto different drawings or reduce the number of details placed on each sheet.
- .6 For projects involving demolition, clearly indicate equipment to be demolished, relocated or refurbished, as well as all information needed to convey the scope of the demolition to the bidders. Include a demolition plan for each discipline, clearly identifying all equipment and materials to be demolished, relocated or refurbished. Provide separate plans for demolition and new construction.

2.3.6 CAD Drawing Standards

- .1 Drawings are generally to be prepared for A1 (841 x 594 mm) sheet size. The following alternate drawing sizes may be used, with the approval of the Project Manager:
 - .1 A0: (1189 x 841 mm)
 - .2 ANSI B (Ledger/Tabloid): (432 x 279 mm aka 11" x 17")
- .2 Drawing units:
 - .1 All drawings are to be created using metric units using the millimetre as the standard unit of measurement (1 unit = 1 mm). Draw all objects in model space 1 to 1 scale. (i.e. a 3000 mm long object is drawn 3000 mm long in CAD)
 - .2 All dimensions and measurements are to be in metric units. Do not round numbers on drawings when converting imperial measurements to metric.
- .3 Title Blocks:
 - .1 Use an approved City of Edmonton CAD template for all drawings. A copy of the CAD template and prototype CTB files are located in this [Master AutoCAD Template & CTB](#) directory; there are any questions or difficulties contact the Project Manager for assistance or referral.
 - .2 Version control shall follow Issue and Revision scheme defined on referenced City of Edmonton CAD Template.
 - .3 Include the Consultant Logo(s) on all title blocks.
 - .4 Consultants' CTB files must be adjusted so that they are congruent with the intended lineweights on the CoE title block template. i.e. While consultants are free to use their own CTB file the CoE title block must render/plot in the same manner as in the supplied template.
- .4 Layers:
 - .1 Overall CAD structure should generally follow the [American Institute of Architects \(AIA\)](#) standards and/or industry best practices.

- .2 A layering scheme acceptable to the City is included as a reference in [Appendix D](#) Sample CAD Layering Standard. This scheme is compatible with the COE.ctb plot style table. It is not a requirement to use this standard when consultants have their own; however layers should be descriptively named, well organized, and adequate in number for the to the complexity of the design.
- .5 Plans, details, and related text are to be created in Model space. Paper space is to be used for laying out the drawing sheet and defining views. Title blocks, general notes, schedules, charts and other non-graphic information may be placed in Paper space. All viewports in paper space should be locked.
- .6 Use only standard AutoCAD font styles. Do not use third party fonts. Text height should be between 2.0 and 3.0 mm for the final plot. Use a consistent text height throughout submission.

2.3.7 Drawing Submission Requirements

- .1 Drawings not complying with the following requirements will be returned for resubmission.
- .2 All CAD drawing submissions are to be provided in the latest Adobe PDF format.
 - .1 All drawings and elements thereof must *exactly* match the native CAD design documents in page format, size, line weight, etc.
 - .2 All drawing PDFs must be of the vector type format, bitmap or scanned drawings are unacceptable.
 - .3 Submissions prior to Record Drawings shall generally be in the form of a single PDF file bookmarked by discipline. In cases where aggregate PDF file size may be an issue, separating into one file per discipline is acceptable.
- .3 Drawings in AutoCAD format may be requested, prior the Record Drawing stage, for use by the City of Edmonton or a Contractor. If so, these DWG files shall provided as per the Record Drawing section requirements below.
- .4 Record Drawings
 - .1 The City of Edmonton requires Record Drawings be submitted as per PDF requirements above, but as one PDF file per drawing sheet. The matching CAD source files must also be submitted in AutoCAD DWG format, one file per drawing sheet.
 1. Any individual drawing file names are to comply with the drawing naming convention. Refer to [Appendix B](#) – Drawing Naming Convention.
 - .2 If drawings were converted from other CAD software or exported from BIM software, the consultant is responsible for ensuring the accuracy of the final AutoCAD files.
 - .3 Submitted AutoCAD files are to have only the one drawing sheet in paper space per DWG file and should generally be self-contained, and independently viewable without a supporting x-ref file structure.
 1. Bind all x-refs in all DWG files submitted to the City using the “Bind” option (not “Insert”) . Purge all unused blocks, dimstyles, layers, styles, linetypes and shapes.

2. When simple monochrome bitmap images, such as logos, are used in drawings, they are to be inserted as OLE objects to ensure they are attached to the drawing file.
3. While detailed bitmap images, such as digital photos or underlays, are generally discouraged, these type of supporting files may be provided as x-refs provided they are relative pathed to the same directory as the DWG file and clearly named with the same file name + suffix(es) "XREF[1,2,etc.]".
4. DWG files that require MEP, AEC or similar extensions to load or view correctly are unacceptable.
- .4 Submitted AutoCAD files are to include the corresponding CTB file used to plot/print. One CTB file per drawing set is preferable, but at most one CTB file per discipline subset will be acceptable.
- .5 Consultants are required to submit a metadata table in spreadsheet format for drawing classification in the City of Edmonton Electronic Document Management System. Contact the Project Manager to secure the latest version and referral for assistance.
- .6 If Building Information Modelling (BIM) software was used, provide a digital copy of the building model in its native format, as well as a format readable with the City's latest viewer.
 1. COBie compatible export tables may also be requested from the BIM model.
- .5 Submit all files on optical disc, memory stick, portable drive, or via file sharing system for City of Edmonton download.
- .6 Confirm with Project Manager if any supplementary hard copies are required.

2.4 **Edmonton Design Committee**

2.4.1 **General**

- .1 The Edmonton Design Committee (EDC) reviews presentations from both Civic Departments and the public in regards to major developmental applications, direct control rezoning applications and public projects with a predetermined downtown and surrounding neighbourhood geographical area.
- .2 The consultant will be required to give a pre-consultation and formal presentation to the EDC for all new buildings.
- .3 For addition and renovation projects, the consultant may be required to participate in a pre-consultation and formal presentation to the EDC. This will be determined on a case-by-case basis. In general, interior renovation projects are not required to be presented to EDC, while renovations which affect the site, the exterior of the building, and require a development permit are required to be presented to the committee.
- .4 All information regarding the Edmonton Design Committee can be accessed from the City of Edmonton webpage.
- .5 The deliverables required for presentations to the EDC and their timing in the design process are outlined in the section - [Consultant Deliverables](#).

3 Design Guidelines

3.1 Sustainable Design

3.1.1 References

- .1 The latest adopted edition of the City of Edmonton Policy C532: *Sustainable Building Policy* can be found on the City of Edmonton website, including any issued Clarification or Interpretation Memorandums. The City of Edmonton C532 Policy describes the City's commitment to sustainable buildings and lists specific minimum design objectives to be achieved. Please note the C532 policy contains a minimum on site renewable energy generation component.
- .2 Latest adopted edition of Canadian Green Building Council, *LEED Canada NC (New Construction) Green Building Rating System*.

3.1.2 Minor Renovations

- .1 Refer to City of Edmonton Policy C532 for sustainable design strategies that can be applied to minor renovations and projects where it may not be feasible to obtain meet C532 objectives.
- .2 Consider sustainable design strategies for all building projects for the City of Edmonton. These strategies will be evaluated on a case-by-case basis.

3.1.3 Specific LEED Credit Requirements

- .1 On projects designed to achieve LEED certification, the following credits shall be implemented and must achieve the minimum credit level indicated. Provide written explanation to the City if any of these credits cannot be pursued:
 - .1 IPc1: Integrative Process
 - .2 LTc2: Sensitive Land Protection
 - .3 LTc6: Bicycle Facilities (pursued on facility side even if bike network not available)
 - .4 SSc1: Site Assessment
 - .5 SSc3: Open Space
 - .6 SSc5: Heat Island Reduction (pursued on roof even if non-roof measures cannot be implemented fulfill credit)
 - .7 WEc1: Outdoor Water Use Reduction
 - .8 WEc2: Indoor Water Use Reduction
 - .9 WEc3: Cooling Tower Water Use / ID Pilot: No cooling tower
 - .10 WEc4: Water Metering
 - .11 EAc1: Enhanced Commissioning, including monitoring-based commissioning
 - .12 EAc2: Optimize Energy Performance (meet C532 energy performance minimums)
 - .13 EAc3: Advanced Energy Metering (M&V)

- .14 EAc5: Renewable Energy Production (meet C532 requirements)
 - .15 EAc6: Enhanced Refrigerant Management
 - .16 MRc5: Construction & Demolition Waste Management
 - .17 EQc1: Enhanced Indoor Air Quality Strategies
 - .18 EQc2: Low-Emitting Materials
 - .19 EQc3: Construction Indoor Air Quality Management Plan
 - .20 EQc4: Indoor Air Quality Assessment
 - .21 EQc5: Thermal Comfort
 - .22 EQc6: Interior Lighting
 - .23 EQc9: Acoustic Performance
 - .24 ID: Green Building Education
- .2 On projects designed to achieve LEED certification, the following shall be considered as priority credits where project conditions and budget allow. Provide written explanation to the City if any of these credits, or point thresholds within these credits, will not be pursued:
- .1 LTc7: Reduced Parking Footprint
 - .2 LTc8: Green Vehicles
 - .3 SSc6: Light Pollution Reduction
 - .4 WEc2: Indoor Water Use Reduction
 - .5 EAc1: Enhanced Commissioning (Envelope Commissioning)
 - .6 EAc4: Demand Response
 - .7 EAc5: Renewable Energy Production
 - .8 EQc1: Enhanced Indoor Air Quality Strategies
 - .9 EQc7: Daylight
 - .10 EQc8: Quality Views
 - .11 ID: Community Outreach & Involvement
 - .12 ID Pilot: Ergonomics Approach
- .3 On projects designed to achieve LEED certification, these credits are potentially attainable based on site location:
- .1 LTc3: High Priority Site
 - .2 LTc4: Surrounding Density & Diverse Uses
 - .3 LTc5: Access to Quality Transit

3.1.4 LEED Responsibilities

- .1 Should the project be required to be LEED certified, the Coordinating Professional shall have a LEED™ AP provide the following is the Basic Services for LEED™ Administration:
 - .1 Review the design for LEED™ certification feasibility
 - .2 Identify the appropriate LEED rating system. i.e LEED™ NC (single application/ multiple) vs LEED™ CS vs LEED™ CI vs LEED™ ND etc.
 - .3 Identify prerequisites and credits that the project has/will be achieving and clarify what needs to be done where non-compliance is an issue.
 - .4 Identify and outline what needs to be done for additional credits.
 - .5 Identify Innovation in Design Credits
 - .6 Create a task matrix that identifies key players and their responsibilities as relates to LEED™ design and certification.
 - .7 Provide support and assistance in understanding LEED™ credit requirements
 - .8 Undertake any additional energy modeling in excess of any code required energy modeling if required for particular credits
 - .9 LEED project Application and Management of the LEED™ Online process.
 - .10 Provide support to key team members in preparing letter templates.
 - .11 Guide and manage the project team, including the contractor throughout the entire LEED accreditation process (design through final received LEED accreditation.)
 - .12 Review letter templates and submittals during construction.
 - .13 Assist the team in responding to comments during the review process.
 - .14 Ensure COE is a co-registrant in the certification process.

3.2 Accessibility

3.2.1 Universal Accessibility

- .1 **General**
 - .1 All public spaces in new buildings are to be universally accessible (barrier-free, gender neutral, age- friendly). All workplace environments are to be barrier-free unless it can be shown that it is unreasonable to do so.
 - .2 The level of barrier-free accessibility for renovations, upgrades, and/or additions is to be determined by the City of Edmonton on an individual project basis.
 - .3 Best practices in the “Checklist for Accessibility & Universal Design” by City of Edmonton Accessibility Advisory Committee shall be achieved, wherever possible. Check the City of Edmonton website for the latest version of this checklist.

.2 References

.1 Required References:

- .1 Alberta Building Code, latest adopted edition.
- .2 City of Edmonton Policy C463: Access to City Buildings. This document can be found on the City of Edmonton website. Note that this policy refers to a document “Manual for Accessibility to City of Edmonton Owned and Occupied Buildings” which is no longer available.

.2 Recommended References:

- .1 “Barrier-free Design Guide”, Barrier-free Design Advisory Committee of the Safety Codes Council and with the assistance of Alberta Municipal Affairs.
- .2 “City of Edmonton Access Design Guide”, City of Edmonton.
- .3 CAN/CSA B651-95, Barrier-free Design, Canadian Standards Association.
- .4 “Design Aid for Barrier-free Accessibility in Existing Buildings”, Alberta Infrastructure.
- .5 “Clearing Our Path” Universal design recommendations for people with vision loss, CNIB.

3.3 Corporate Space Guidelines

3.3.1 General

- .1 The City of Edmonton’s Administrative Directive A1407B: Provision of Office and Special Purpose Accommodation for Civic Staff has guidelines establishing office space requirements for typical office staff and positions. Obtain the most current copy of the Corporate Space Guidelines from the Project Manager prior to beginning design on a project with office space.
- .2 All new furniture should be in accordance with [Blueprint](#).

3.4 Percent for Art Process

3.4.1 General

- .1 The latest adopted version of the Percent for Art City Policy C458c is available of the City of Edmonton Website. The City of Edmonton will allocate one percent (1%) of the qualifying construction budget of any publicly accessible municipal project for the procurement of art to be publicly displayed.
- .2 The Public Art procurement process is managed by the Edmonton Arts Council (EAC). The process for commissioning an artwork varies depending on the budget.
- .3 The Project Manager will arrange a meeting between the consultant and the Edmonton Arts Council at the end of Schematic Design to discuss the budget for art on the project and the process that will be used to select the artist and artwork.
- .4 Typically, the consultant, EAC, Project Manager, and City of Edmonton Project Architect will work together to develop three site location alternatives for public art pieces. A drawing produced by

the consultant showing these locations will become part of the Edmonton Design Committee submissions.

- .5 The Consultant shall provide general information on the project to the EAC for the Call to Artists. This information shall also include restrictive criteria for the artworks as the consultant sees fit, such as maximum size and weight. The consultant may be required to answer questions during the proposal call. The consultant shall have one vote of seven on either one or two juries to select the artist and final artwork. A typical jury session is a half day commitment.
- .6 Once the artist and artwork is selected, the Consultant shall coordinate as necessary with the artist and may be asked to make minor provisions for the art piece, such as provide power in a specific location. The Edmonton Arts Council will continue to be the primary contact for the artist through the project duration.

3.5 City Department Design Standards

3.5.1 General

- .1 Some departments within the City of Edmonton have supplementary design standards that must be incorporated into new building projects. These departments include, but are not limited to:
 - .1 Transportation (LRT & bus terminals)
 - .2 Edmonton Public Library
 - .3 Edmonton Police Service
 - .4 Fire Rescue Service
- .2 Prior to commencing design work, consult with the Project Manager to determine any additional standards to be used.

3.6 Historic Resources

3.6.1 References

- .1 Designation and Rehabilitation of Municipal Historic Resources in Edmonton, Policy Number C450B, City of Edmonton, September 2008. This document can be found on the City of Edmonton website.

3.6.2 General

- .1 This policy provides guidelines for the identification, management, protection and promotion of historic resources.
- .2 Prior to commencing design work, consult with the Project Manager to determine if the building is a Provincial Historic resource and/or a Municipal Historic Resource, so they can track the project and ensure that legislation is being followed and the heritage designations are being preserved.

3.7 Building Life Expectancy

3.7.1 General

- .1 Consider the life expectancy of the building when designing the building envelope, making material choices and designing building systems. Consult with Project Manager prior to commencing design work.
- .2 Interior Finishes shall be chosen to be durable and last their expected life/aesthetic life expectancy ie) porcelain floor tile in high traffic areas should be specified porcelain tile with integral colour and not just surface glazed.
- .3 All building materials shall be durable, and specified appropriately for their intended use.
 - ie) Waterproof grout such as Epoxy grout, shall be specified where it is expected to be in contact with water or staining is expected to occur.
- .4 Refer to the latest adopted [Infrastructure Asset Management Policy C598](#) which can be found on the City of Edmonton Website.

3.8 Crime Prevention through Environmental Design (CPTED)

3.8.1 References

- .1 Design Guide for a Safer City, 1995. This document can be found on the City of Edmonton website.
- .2 Alberta Infrastructure - Technical Design requirements, Chapter 12.0 CPTED. February 2018.

3.8.2 General

- .1 CPTED is a proactive design philosophy built around a core set of principles that is based on the belief that *the proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime as well as an improvement in the quality of life*. CPTED is part of a community approach to crime prevention that complements community-based policing.
- .2 CPTED goes beyond conventional approaches of target hardening and active systems (camera's, locks, onsite security personal etc.) to safeguarding the environment by exploiting; natural forms of surveillance, access control and territorial reinforcement in a deliberate attempt to present a psychological deterrent for the purpose of positively influencing human behaviour as people interact with the environment.
- .3 Consultants should request documentation of any previous CPTED audits of the existing facility or CPTED audits of similar facility types to help inform their design.
- .4 Consultants shall engage and comment on all three CPTED design principles within their designs.
 - .1 Natural Forms of Surveillance
 - .2 Access Control
 - .3 Territorial Reinforcement
- .5 Where indicated in the project professional service agreement, CPTED audits shall be performed by an agent with an CPTED Enhanced Training Certificate provided by Edmonton Police Service or a pre-approved equivalent. Confirm requirements with the City of Edmonton Project Manager.

3.9 North Saskatchewan River Valley Area Redevelopment Plan

3.9.1 References

- .1 North Saskatchewan River Valley Area Redevelopment Plan, Bylaw 7188, City of Edmonton, February 1985 (Office Consolidation June 2010). This document can be found by searching the document name on the City of Edmonton website.
- .2 A Guide to Environmental Review Requirements (In the North Saskatchewan River Valley and Ravine System), City of Edmonton, December 2000. This document can be found on the City of Edmonton website.

3.9.2 General

- .1 The bylaw is in place to protect the North Saskatchewan River Valley and Ravine System and establish principles for future development in those areas.
- .2 Refer to these documents when the project takes place in the North Saskatchewan River Valley system, as defined in Bylaw 7188.

3.10 Environmental Management (Enviso)

3.10.1 References

- .1 City of Edmonton Enviso Website: www.edmonton.ca/enviso
- .2 Contractor Environmental Responsibilities Package: Engineering Design & Architectural Services, City of Edmonton. This document can be found on the City of Edmonton website.

3.10.2 General

- .1 Enviso is the name of the City's environmental management system.
- .2 The Consultant is to identify and understand the potential environmental implications of the project. Environmental considerations include, but are not limited to, spills and releases, contamination discovery, noise, erosion and sedimentation control, water conservation & efficiency, drainage of wastewater & stormwater, energy conservation & efficiency, tree protection, natural area protection, waste management, and material & resource conservation. Refer to the City of Edmonton Enviso website for further details on the program.
- .3 The Consultant may be required to sign an Environmental Acknowledgement Form prior to commencing work on the project. This form is included as an appendix in the Consultant's Environmental Responsibilities Package: Engineering Design & Architectural Services document. When required, this will be identified in the Professional Services Agreement (PSA).

3.10.3 Environmental Permits/Approvals Checklist

- .1 The Consultant is required to complete the "Design Environmental Permits/Approvals Checklist" during design for all projects involving construction of new buildings, building demolitions with site disturbance, or hazardous material remediation affecting the site. This form is to ensure environmental permits, approvals and restrictions are identified and in place before construction.

- .2 The City requires up-to-date copies of this checklist to be submitted with the Design Development submission and Pre-Bid Submission, however it is the Consultant's responsibility to ensure the process of identifying requirements and seeking approvals happens as early as necessary in design to ensure the project schedule is not impacted. The Checklist User Guide indicates typical approval timelines.
- .3 Obtain a copy of the most recent version of the Checklist and the Checklist User Guide from the Project Manager at the start of every project.

3.11 Erosion and Sedimentation Control Guidelines

3.11.1 References

- .1 Erosion and Sedimentation Control Guidelines, City of Edmonton, Jan 2005. This document can be found on the City of Edmonton website.
- .2 Erosion and Sedimentation Control Field Manual, City of Edmonton, Jan 2005. This document can be found on the City of Edmonton website.

3.11.2 General

- .1 The Erosion and Sedimentation Control Guidelines and Field Manual were developed to assist City of Edmonton departments and staff, owners and developers, consultants, and contractors to understand the City's ESC requirements to achieve effective stewardship of environmental resources and continual improvement.
- .2 If the project has potential erosion and sedimentation impacts on the environment, the City's Erosion and Sedimentation Guidelines are available to assist the Consultant in complying with all regulatory requirements.

3.12 Commissioning Guidelines

3.12.1 References

- .1 Commissioning Consultant Manual Volume 1 - Whole Building Commissioning Process and Guidelines, City of Edmonton, latest revision including associated appendices and references. This document can be obtained through the Project Manager.
- .2 Commissioning Consultant Manual Volume 2 - Building Envelope Commissioning Process and Guidelines, City of Edmonton, latest revision including associated appendices and references.

3.12.2 General

- .1 The Commissioning Consultant Manuals were developed as a reference for consultants providing commissioning services for new building projects and renovations to existing facilities owned or operated by the City of Edmonton.

3.13 City Design & Construction Guidelines

3.13.1 References

- .1 The standards are organized into eight volumes by discipline. Each volume contains a design section, specifications and drawings as required, plus any other guidelines or manuals appropriate to that discipline. All City Design & Construction Guidelines are available via the City of Edmonton website.
- .2 Additional City Design and Construction Guidelines are available on the city website. Please reference the most recent version of the applicable standards. These include but are not limited to:
 - .1 General
 - .2 Roadways
 - .3 Drainage
 - .4 Water
 - .5 Landscaping
 - .6 Street Lighting
 - .7 Power
 - .8 Pavement Markings
 - .9 https://www.edmonton.ca/city_government/urban_planning_and_design/city-design-construction-standards.aspx

3.14 Visual Identity Standards

3.14.1 References

- .1 All deliverables which are intended for the public or Council shall adhere to the City of Edmonton's Visual Identity Standards. Anyone producing materials for the City of Edmonton should refer to the [Foundational Elements](#) standard. Standards are available on the City of Edmonton website.
- .2 Additional access standards, communication templates, project stage visual identifier logo, City of Edmonton Logo, vector files and other resources to guide consistent OneCity approach to the City's visual identity are available through the Project Manager.

APPENDIX A - REPORT GUIDELINES

1. General

- .1 The purpose of this guideline is to establish a standardized format for architectural and engineering reports and studies not defined in Section – [Consultant Deliverables](#).

2. Contents

- .1 In general, each report and study will contain the following:
 - .1 Executive Summary
 - .2 Introduction
 - .3 Findings, Analysis, and Conclusions (collated for each major concept in the report)
 - .4 Recommendations and Cost Estimates (collated for each major concept in the report)
 - .5 Appendix

3. Structure

- .1 The head of each page shall list the name of the facility under study, the title of the study, the report section, the City of Edmonton project number, and the section page number.
- .2 Each report will begin with a cover page displaying the project title, project number, list of consultants, and date of submission of the final report.
- .3 Provide a detailed table of contents, including a listing of all appendices.
- .4 Depending on the length and complexity of the report, cover pages for each individual report section may be provided.

4. Introduction

- .1 Provide a general description of the building or building system under review:
 - .1 Address
 - .2 Date of construction
 - .3 Occupancy classification
 - .4 Building area
- .2 The introduction shall contain a clear statement of the purpose of the report. This statement will address:
 - .1 Why the work is being done; and
 - .2 What is to be accomplished by doing the work (ie. the end result).
- .3 Provide a brief outline of the scope of work, how the work is to be done, and when the work will be completed.

5. Executive Summary

- .1 The executive summary shall be a synopsis of the report purpose, conclusions, and recommendations, complete with a total estimated cost figure for the recommendation.

- .2 The executive summary shall not be longer than one page, except for exceptionally comprehensive reports.
- .3 Minimum items to be addressed shall be;
 - .1 Description of issue
 - .2 Outline options;
 - Do nothing
 - Briefly outline action items, in order of effort and cost
 - Recommended course of action

6. Findings, Analysis, and Conclusions

- .1 Findings:
 - .1 Describe existing site conditions, and give source of information (examination of construction documents, site inspections, interviews with knowledgeable personnel, or examination of previously prepared reports).
 - .2 Describe existing building or system modes of operation.
- .2 Analysis:
 - .1 Present an analysis of the findings, and examination of methods of solving the problem under review.
 - .2 Include the results of calculations which may be required to evaluate conditions or solutions.
- .3 Conclusions:
 - .1 Include a brief description of all remedial action considered, advantages and disadvantages of each (this is to include actions which are considered but may be rejected). Provide evaluation matrix as appropriate.
 - .2 Determine optimum solution. Where alternatives are presented, such alternatives should be prioritized.

7. Recommendations and Cost Estimates

- .1 Provide statement of recommended courses of action, complete with total estimated costs.
- .2 Where more than one action is required, recommendations should be prioritized where possible (to suit budget constraints, time constraints, etc.). Prioritize on the basis of:
 - .1 Life hazard;
 - .2 Code violation;
 - .3 Environmental Contamination;
 - .4 Functional upgrade (high priority); and
 - .5 Functional upgrade (low priority).
- .3 Where recommendations are made, sufficient detail shall be given to ensure that remedial work can in fact be carried out as envisaged. Provide sketch drawings as required.

- .4 Where applicable, explain the effect of recommended construction on the operation of the building or building system in question (personnel relocation required, after hours work, service shut-down, etc.).
- .5 Where applicable, identify opportunities for phasing of the work. This will be of value in project planning, where budget constraints may dictate a phased approach, occurring over several years.
- .6 Where applicable, give preliminary estimates of time of construction, and highlight any items of long delivery which may affect the schedule. Specify that estimates are for time of construction only.
- .7 Where applicable, give preliminary estimates for recommended measures with breakdown. Specify that costs do not include design or project management fees. Specify the limits of accuracy of the estimates.

8. Appendix

- .1 The appendix shall contain:
 - .1 Copies of all information referenced in the body of the report (i.e. Technical papers, product information, previous related information);
 - .2 Detailed photographs illustrating existing conditions;
 - .3 Detailed calculations of estimated costs;
 - .4 Sketch drawings and schematics showing existing and recommended construction; and
 - .5 Copies of calculations carried out to check existing system capacities, or required to support analysis and recommendations, energy consumption, payback periods.

9. Report Presentation & Submission

- .1 All reports must be electronic files submitted as vector PDFs with appropriate bookmark structure and fully text searchable. Bitmap or scanned submissions are unacceptable except as embedded photos or historical content. Any embedded bitmap text content shall be fully OCRd.
- .2 Submit all files on optical disc, memory stick, portable drive, or via file sharing system for City of Edmonton download.
- .3 Confirm with Project Manager if any supplementary hard copies are required.

APPENDIX B - DRAWING FILE NAMING CONVENTION

1. General

- File names for all project drawings are to follow the convention described in this Appendix. Include the drawing file name under "File" at the bottom of the title block (this is automated in the CoE CAD Template). Due to limited space on the title block, the name can be shortened by excluding the Drawing Title (eg. CEN101(MN)-A000-[CP-008342].dwg).

Sample drawing file name:

CEN101(MN)-A000 Exterior Elevations-[CP-008342].{dwg/pdf}

CEN101

The City of Edmonton Facility ID for the building or site as provided by Project Manager or City of Edmonton Facility Inventory Management (CAFM) group; email "fim@edmonton.ca" or "cafms@edmonton.ca".

MN

Floor Number as listed on the drawing - Follow existing and/or contact Edmonton Facility Inventory Management (CAFM) group; email "fim@edmonton.ca" or "cafms@edmonton.ca". Typical values are:

FD	Foundation
SB	Sub-Basement
BM	Basement
MN	Main Floor
02	Second Floor
MZ	Mezzanine
RF	Roof
L1	Lower Level 1
P1	Parking Level 1
XX	Drawing with no designated floor (i.e. Schedule)

A000

Drawing number in a particular discipline's set. Usually assembled as [Discipline]+[Sheet number in that discipline's set]. Common discipline codes are:

C	Civil (Site)
L	Landscape Architecture (may use Civil)
A	Architectural
S	Structural
M	Mechanical
E	Electrical
F	Fire Protection (may use Mechanical)
P	Pool

Exterior Elevations

Drawing Title, in title case (major words capitalized)

CP-008342

Project Number as supplied by Project Manager

.dwg/pdf

AutoCAD or PDF file extension

APPENDIX C - CONSTRUCTION COST ESTIMATES

1. Construction Cost Estimates

- .1 The Consultant is required to provide the estimates stated below to the accuracies shown, The consultant shall submit project estimates in the format consistent with Uniformat II categories of Substructure, Shell, Interiors, Services, Equipment and Furnishings, Special Construction and Demolition, Building Sitework, and General Requirements. In the event of uncertainty over the category of any element, the Consultant shall obtain clarification from the City.:

Project Phase	Level of Accuracy
Programming	Class 5 (- 30% to +50%)
Concept/Pre-Design	Class 4 (- 20% to +30%)
Schematic Design	Class 3 (- 15% to +20%)
Design Development	Class 3 (- 15% to +20%)
Working Drawing (Progress Submission)	Class 2 (- 10% to +15%)
Working Drawing (Pre-Bid Submission)	Class 1 (- 5% to +10%)

References:

Canadian Construction Document Committee, CCDC 5B – 2010 Construction Management Contract – for Services and Construction (2010).

ASTM E 2516 -06 Cost Estimate Classification System, Fig 2.

“Class A[1] Construction Cost Estimate: The Class A Construction Cost estimate of the Construction Cost based on the completed Contract Documents. Class A Construction Cost Estimate is the final estimate before the bid or proposal call. Class A Construction Cost Estimate shall be presented in elemental format and include labour and material costs, allowance for all costs resulting from the Project schedule, all actual associated costs, including cash allowances, contingencies, allowances for design, escalation, market conditions and anticipated amendment amounts as applicable.

Class B[2] Construction Cost Estimate: The Class B Construction Cost Estimate is an estimate of the Construction Cost with a level of precision that is based on the degree of completion of the Contract Documents at the time of preparation of the estimate. The Class B Construction Cost Estimate is typically prepared when all site or installation investigations are completed and the design of the major systems and subsystems of the Project (including outline specifications and preliminary drawings and models) are well underway. Class B Construction Cost Estimate shall be presented in elemental format and include labour and material costs, allowance for all costs resulting from the Project schedule, all actual associated costs, including cash allowances, contingencies, allowances for design, escalation, market conditions and anticipated amendment amounts as applicable.

Class C[3] Construction Cost Estimate: The Class C Construction Cost Estimate is an estimate of the Construction Cost based on updated Owner requirements, general description of the Project, preliminary site information and existing conditions, and takes into consideration market conditions as well as basic implementation logistics. Class C Construction Cost Estimate shall include labour and material costs and the Owner's construction contingencies and allowances.

Class D[4] Construction Cost Estimate: The Class D Construction Cost Estimate is an estimate of the Construction Cost based on the Owner's functional requirements to the degree known at the time. The Class D Construction Cost Estimate shall as a minimum be based on historical cost data for similar projects, suitably adjusted for such factors as inflation, location, risk, quality, size, and time. All related factors affecting cost are considered to the extent possible. The Class D Construction Cost Estimate provides the Owner an indication of the order of magnitude of the Construction Cost for a project completed within the estimated completion date, and shall include labour and material costs and the Owner's construction contingencies and allowances.

Construction Cost: Construction Cost means the actual cost of all elements of the Project including all applicable taxes but excluding the applicable value added taxes, whether recoverable or not. Construction Cost does not include the Construction Manager's Fee, the reimbursable expenses for the Services... [or] the compensation of the Consultant." (CCDC 5B, 2010, p.15)

APPENDIX D - SAMPLE CAD LAYERING STANDARD

1. General

- .1 This appendix contains a sample CAD layering standard that may be used on facility projects for the City of Edmonton where the consultant does not have their own system. This is not a mandatory requirement, however any layering standard used must comply with the requirements indicated in CAD Drawing Standards.
- .2 This standard has been designed to:
 - .1 Organize graphical information so that it can be effectively grouped and manipulated for display, editing and plotting purposes.
 - .2 Ensure that all CAD based design drawings are structured and formatted consistently for archival and retrieval purposes.
 - .3 Organize drawing information in layers that can be used for both initial project development and ongoing facility management purposes.
- .3 Table D-1: CAD Layering Standard

X-YYYY-ZZZZ	
X	Major Group
	<ul style="list-style-type: none"> C Civil Engineering and Site Work L Landscape Architecture (optional) A Architecture, Interiors and Facilities S Structural M Mechanical E Electrical and Electrical Auxiliary Systems P Pool Systems (optional) F Fire Protection (optional)
YYYY	Minor Group
	This group comprises up to 4 characters and is used to subdivide the major group on the basis of construction components or building contents. Refer to Table D-2.
ZZZZ	Modifiers Group
	This group comprises up to 4 characters may be used to further differentiate minor groups. The use of a modifier is optional and is not required if the major and minor group designations for a layer are sufficient. Refer to Table D-3.

Table D-2: Minor Group

- .1 This table indicates common labels for the Minor Group (YYYY). Additional Minor Groups may be added as necessary.
- .2 Except where indicated, layer color may be any of the AutoCAD colours 1 to 8. Select color to ensure the appropriate line-weight is plotted when using the COE.ctb plot style table. Different colours may be used for different layers within the Minor Group. For example, A-WALL-FULL may use a different colour than A-WALL-TEXT.
- .3 Drawing Information Layers may be used with any discipline, as necessary.

DRAWING INFORMATION LAYERS (Minor Group)		
<u>Layer Name</u>	<u>Description</u>	<u>Colour</u>
*-SCHD	Schedules	White
*-LEGN	Legend of Symbols	White
ARCHITECTURAL, INTERIORS AND FACILITIES		
<u>Layer Name</u>	<u>Description</u>	<u>Colour</u>
A-WALL	Walls	1 to 8
A-DOOR	Doors	1 to 8
A-GLAZ	Windows, Glazing, Curtain Walls	1 to 8
A-FLR	Floor Information	1 to 8
A-FURN	Furniture	1 to 8
A-EQPM	Equipment	1 to 8
A-CLNG	Ceilings	1 to 8
A-ROOF	Roof	1 to 8
A-FENC	Fencing	1 to 8
A-PMFN	Materials & Finish Plan	1 to 8
A-FIRE	Fire Separations	1 to 8
STRUCTURAL		
<u>Layer Name</u>	<u>Description</u>	<u>Colour</u>
S-GRID	Column Grid	1 to 8
S-FNDN	Foundation Piles, Piers & Reinforcing	1 to 8
S-SLAB	Concrete Slab	1 to 8
S-ABLT	Anchor Bolts	1 to 8
S-COL	Columns	1 to 8
S-WALLS	Structural Bearing and Shear Walls	1 to 8
S-METL	Miscellaneous Metal	1 to 8
S-FRAM	Framing (Beams, Joists)	1 to 8
MECHANICAL		
<u>Layer Name</u>	<u>Description</u>	<u>Colour</u>
M-CONT	Controls & Instrumentation	1 to 8
M-DUST	Dust and Fume Collection Systems	1 to 8
M-ELHT	Electrical Heat Equipment	1 to 8
M-ENER	Energy Management Systems	1 to 8
M-EXHS	Exhaust Systems	1 to 8
M-FUEL	Fuel Systems (excluding natural gas)	1 to 8
M-HVAC	HVAC Systems	1 to 8

M-HOTW	Hot Water Heating System	1 to 8
M-CWTR	Chilled Water System	1 to 8
M-NGAS	Natural Gas System	1 to 8
M-PROC	Process System	1 to 8
M-REFG	Refrigeration System	1 to 8
M-STEM	Steam System	1 to 8
M-DOMW	Domestic Water System	1 to 8
M-SANR	Sanitary Drainage	1 to 8
M-STRM	Storm Drainage	1 to 8
M-EQPM	Misc. Plumbing Equipment	1 to 8
M-CO2S	CO2 System	1 to 8
M-SPRN	Fire Sprinkler System	1 to 8
M-STAN	Standpipe System	1 to 8

ELECTRICAL

<u>Layer Name</u>	<u>Description</u>	<u>Colour</u>
E-LTG	Lighting	1 to 8
E-PWR	Electrical Power	1 to 8
E-FIRE	Fire Protection System	1 to 8
E-CTRL	Electrical Control System	1 to 8
E-GRD	Ground System	1 to 8
E-CCTV	Closed Circuit Television System	1 to 8
E-VOC	Voice Communication Connections	1 to 8
E-DATA	Data Communication Connections	1 to 8
E-SEC	Security System	1 to 8
E-SND	Sound and Public Address System	1 to 8
E-EMRG	Emergency System	1 to 8

CIVIL

<u>Layer Name</u>	<u>Description</u>	<u>Colour</u>
C-PROP	Property Lines, Easements, Right of Way	1 to 8
C-TOPO	Contour Lines and Elevations	1 to 8
C-BLDG	Building Footprint	1 to 8
C-PKNG	Surface Parking Lots	1 to 8
C-ROAD	Roads including Lines & Curbs	1 to 8
C-STRM	Storm Drainage Site Services	1 to 8
C-ELTR	Electrical Site Services	1 to 8
C-COMM	Communications Site Services	1 to 8
C-WATR	Domestic Water Site Services	1 to 8
C-FIRE	Fire Protection Site Services	1 to 8
C-NGAS	Natural Gas Site Services	1 to 8
C-SSWR	Sanitary Sewer Site Services	1 to 8

LANDSCAPING AND SITE WORK

<u>Layer Name</u>	<u>Description</u>	<u>Colour</u>
C-PLNT	Plants and Landscaping	1 to 8
C-IRRG	Irrigation System	1 to 8
C-WALK	Walkways and Steps	1 to 8
C-SIGN	Site Signage	1 to 8
C-SITE	Site Improvements	1 to 8

.4 Table D-3: Modifiers Group

- .1 This table indicates common labels for the Modifiers Group (ZZZZ). Additional Modifiers may be used as necessary. Modifiers may be used with any Minor Groups, as needed.

BUILDING INFORMATION LAYERS		
<u>Layer Name</u>	<u>Description</u>	<u>Colour</u>
*_****-IDEN	Identification Data	1 to 8
*_****-PATT	Cross-hatching Pattern	1 to 8
*_****-DEMO	Existing to be Demolished (Hidden Linetype)	1 to 8
*_****-NEW	New or Proposed Work	1 to 8
DRAWING INFORMATION LAYERS		
<u>Layer Name</u>	<u>Description</u>	<u>Colour</u>
*_****-NOTE	Notes	1 to 8
*_****-TEXT	General Information and Specification	1 to 8
*_****-SYMB	Symbols, Bubbles, etc.	1 to 8
*_****-DIMS	Dimensions	1 to 8
*_****-PATT	Cross-hatching Pattern	1 to 8
*_****-DETL	Detail	1 to 8
*_****-ELEV	Elevation	1 to 8
*_****-EXTR	Exterior	1 to 8
*_****-NAME	Name (i.e. Room Name)	1 to 8
*_****-SECT	Section	1 to 8
*_****-EQPM	Equipment	1 to 8
*_****-PIPE	Piping	1 to 8
*_****-DUCT	Ductwork	1 to 8
*_****-FIXT	Fixtures	1 to 8
*_****-WALL	Wall Mounted Equipment	1 to 8
*_****-CEIL	Ceiling Mounted Equipment	1 to 8
*_****-CIRC	Circuit	1 to 8
*_****-UNDR	Underground	1 to 8
*_****-OVHD	Overhead	1 to 8
*_****-NPLT	Non-plot Information and Construction Lines (Defpoint layer)	1 to 8
*_****-PLOT	Plotting Targets and Windows (Defpoint layer)	1 to 8
*_****-RDME	Read-Me layer (Defpoint layer)	1 to 8

APPENDIX E - STANDARD DOCUMENT EXAMPLES

1. General

- 1.1. Request the latest versions of the standard documents and templates from the CoE Project Manager.

Acknowledgement Form

On this _____ day of _____, 20____, I _____ (consultant's full name)
representative of _____ (firm's name) confirm to have read the City of Edmonton
Consultant's Manual Volume 1 & 2, and acknowledge that it describes the expected Design Processes and
Technical Guidelines to follow.

Consultant's Signature