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INTEGRATED INFRASTRUCTURE SERVICES

Facility Engineering Services

Facility Planning & Design

Facility Infrastructure Delivery

Facility Design & Construction Consultant Manual

Volume 1

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Design Process and Guidelines v06

Edmonton

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1. Introduction

1.1. Purpose and Scope

- 1.1.1. This document is intended to be used for the following purposes:
 - 1.1.1.1. A reference for consultants providing services for new building projects and renovations to existing facilities owned or operated by the City of Edmonton.
 - 1.1.1.2. A resource for the City of Edmonton when reviewing and evaluating the work performed by architectural and engineering firms on City facility projects.
- 1.1.2. This document is Volume 1 of 2 and is divided into the following sections:
 - 1.1.2.1. Section 1 – Introduction: Establishes the scope of the document and gives general contact information.
 - 1.1.2.2. Section 2 – Design Process: Describes the information flow on a typical project, standard deliverables expected at each milestone, and an overview of minimum document and CAD standards to be followed.
 - 1.1.2.3. Section 3 – Design Guidelines: Describes City policies and design guidelines and their relative administrative procedures 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, review with your Professional Service Agreement and/or Standing Arrangement Project call-up to confirm if required.
- 1.1.3. Consultant Manual - Volume 2 of 2 contains the following section:
 - 1.1.3.1. Section 4 – Technical Guidelines: Discipline specific guidelines to consider for the design and construction of buildings for the City of Edmonton.
- 1.1.4. 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 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.
- 1.1.5. 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.
- 1.1.6. Request the latest versions of the standard documents and templates from the CoE Project Manager.
- 1.1.7. **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 acknowledgment form is included as an appendix (Appendix E).**

1.2. Definitions

- 1.2.1. Unless otherwise specified, words used in this document have the same meaning as defined in the Professional Service Agreement.
- 1.2.2. **Professional Services Agreement (PSA):** The Agreement the Consultant enters into with the City to perform the Work. This document includes the Contract Form, Description of Work, Payment Terms, General Conditions, and Supplementary Conditions (if applicable).
- 1.2.3. **Technical Review:** The process in which the Project Manager circulates Consultant deliverables for review, markup, or comment from Internal City Project stakeholders. Technical reviewers typically include the Project Business Area, Commissioning Agents, Construction Managers, Architectural Services, Engineering Services, and Facility Maintenance Services - Project Review Team (PRT). Reviews may include other stakeholders including Open Spaces - Landscape Architect, Heritage Planning, Corporate Security, and others.
- 1.2.4. **Renewal:** Investment in existing infrastructure to restore to its former condition and may extend its service life. Capital investment in renewal extends the period of service potential but does not change the replacement value, and so does not increase the size of the infrastructure asset portfolio. The renewal includes rehabilitation and replacement. ([C598 Policy](#))
- 1.2.4.1. **Rehabilitation:** The action of restoring or replacing parts or components of an infrastructure asset to a former condition or status. Generally involves repairing the asset to deliver its original level of service without resorting to significant upgrading or renewal, using available techniques and standards. ([C598 Policy](#))
- 1.2.4.2. **Replacement:** The action of replacing an infrastructure asset so as to provide a similar, or an agreed alternative, level of service. ([C598 Policy](#))
- 1.2.5. **Growth (Scope):** Investment in the upgrade of existing infrastructure assets or development of new infrastructure assets (created or acquired), which increase the value of the overall portfolio of assets. These actions increase or add to the intended Level of Service provided by the City's portfolio of infrastructure assets.
- 1.2.6. **Consequential Change:** Any change to a Professional Work Product (PWP) affected during PWP Implementation that has a material effect on the integrity of the design and/or requires input and approval from the authenticating Licensed Professional.

1.3. Contact Information

- 1.3.1.1. 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.
- 1.3.1.2. Please note all additions and changes made to the Consultant Manual Volumes 1 and 2 have been highlighted in green.
- 1.3.1.3. Consultant input to the progressive updating of this document is invited. Please direct comments to:

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

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

Supervisor, Facility Engineering
 Facility Engineering Services
 Infrastructure Planning & Design
 Integrated Infrastructure Services
 13th Floor, Edmonton Tower
 10111 – 104 Avenue
 Edmonton, AB T5J 0J4
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2. Design Process

2.1. Project Communication

2.1.1. General

- 2.1.1.1. 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.
- 2.1.1.2. 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.
- 2.1.1.3. 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.
- 2.1.1.4. 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

- 2.2.1.1. 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 scaled-down reports, rehabilitations may remove deliverables un-related to the project, or a larger project may be phased in such a way that more or less is required from the consultant at each phase.

Modifications to consultant deliverables required for projects are identified in the *Professional Services Agreement (PSA)*, or in the case of a standing arrangement, in the project Call-Up request for proposal.

- 2.2.1.2. 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.
- 2.2.1.3. All submissions will be subject to a *Technical Review*.

- .1 The consultant is to respond to all *Technical Review* comments in writing to the Project Manager prior to commencing work on the next submission. These written responses are to be included in the next submission in an appendix.
- .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.

- 2.2.1.4. 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*.

2.2.2. Pre-Design & Additional Services

The purpose of the pre-design phase is to provide both the [City] and the [Prime Consultant] with a foundation and necessary information for design decision-making. During pre-design, the purpose and objectives of the design-construction program are established. (The Canadian Handbook of Practice for Architects, RAIC 2020)

Refer to your *Professional Service Agreement* for direction on whether any of the following typical Pre-Design services are required for your project;

2.2.2.1. Functional Programming

- .1 In preparing a functional program, the consultant's 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 *Functional Programming* 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, the 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 The report is to include the following:
 - .1 A written description of the 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 is 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. Consultants may use their typical room data sheet template and circulate a copy to the Project Manager for review and approval for use.
- .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 number 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.

2.2.2.2. **Functional Program Validation**

- .1 Verify the accuracy of the decisions made in the original functional program including but not limited to; number and size of individual spaces, overall size, operational model, growth model, and any cost estimates.
- .2 Where a conflict between the Functional Program and current industry standards and or City/Stakeholder input occurs, provide a brief summary of the required changes which can be appended to the Functional Program for future reference.

2.2.2.3. **Scope Validation (Renewal projects):**

Scope validation is required to manage the development and prioritization of an in-depth scope of work and related cost estimates. It is developed by reviewing existing documentation available, and by meeting with the relevant stakeholders across the City of Edmonton organization to gather information and make recommendations about scope priorities. The scope validation report will be used by the City to determine which scopes should move forward for the design phase and be completed within the present project budget or be deferred for later work.

.1 Scope Validation: Information Gathering:

1. Review of existing City supplied information such as Building Condition Assessments and/or scope register.
2. Recommendation for, and definition of, any non-destructive or destructive testing required to verify existing conditions.
3. An on-site scope confirmation exercise:
 - .1 Engagement with key stakeholders (identified by the City) to determine whether there are other issues related to the operations or maintenance of the building systems that may require additional consideration.
 - .2 confirm interdependencies with the scope of work identified in the RFP.
 - .3 overall review of the facility to determine whether there are any other issues not identified in the scope of work or emergent since the production of the last building condition assessment.
 - .4 review the facility against the scope of work to confirm the validity of each listed item listed;
 - .1 has the item already been repaired/replaced?
 - .2 for items flagged for renewal due to being past/at end of life, advise on whether their actual condition also merits replacement, or they can continue operating and for how many years.
 - .3 Where applicable, please advise whether a full asset replacement or spot/selective repair/patch/replacement is recommended - especially for scope items that cover large areas such as flooring, carpets, ceilings, etc.
4. Review the stated scope of renewal work in its existing condition for compliance with the latest National Building Code (Alberta Edition), Alberta Occupational Health and Safety Code, Canadian Electrical Code, and ASHRAE and incorporate the changes necessary to ensure safe operation. For all code compliance recommendations please validate whether the asset is also recommended for renewal due to its condition irrespective of code issues.

.2 Scope Validation: Prioritization

1. Establish a prioritization of scope based on life safety and building systems that are at critical risk of failure; code upgrades (including recommended barrier-free upgrades); and energy efficiency impacts, duration of construction schedules required for the scope of work, and any guidelines of scheduling shutdowns. Prioritization will need to be completed with input from the key stakeholders identified.

.3 Scope Validation: Growth Scope

1. Clearly show the City's defined scope separately from any growth scope recommended by the consultant or requested by Stakeholders during the Scope Validation process. Any growth scope items will require an application for additional funding outside the approved Construction Budget.

.4 Scope Validation: Cost Estimate

1. Once the full scope of work is defined, a Class 4 Cost estimate shall be completed.
2. Identify and provide cost estimates for scopes of work that were not identified in the original scope register provided by the City, but are directly related and required due to the work requested by the City. ie) upgrading a service, firestopping, etc.

2.2.2.4. Sustainable Design

- .1 Refer to Section - [Sustainable Design](#) for the design requirements associated with providing additional services as may be required for each relevant Administrative Procedure, including:
 - .1 Energy Modelling
 - .2 Greenhouse Gas (GHG) Energy & Cost Tracking for Existing Buildings
 - .3 Climate Risk & Vulnerability Assessment
 - .4 Future Proofing
 - .5 LEED
- .2 Refer to your *Professional Service Agreement* for additional detailed information regarding services and formats of deliverables related to the following:
 - .1 Embodied Carbon Analysis
 - .2 Life Cycle Costing Evaluation
 - .3 Measurement & Verification
 - .4 Additional detailed information for Greenhouse Gas (GHG) Energy & Cost Tracking for Existing Buildings

2.2.2.5. **Measured Drawings:**

- .1 Ascertain the purpose of the measured drawings and the accuracy required. After confirming the purpose with the City, make/coordinate measurements, augment with photographs and field notes, and prepare drawings.
- .2 The Consultant shall use any information provided by the city, the measured drawings, and/or the 3D scans to prepare drawings required for the scope of work, in electronic (AutoCAD) and PDF formats to the City. These may include a basic site plan, floor plan(s), roof plan, exterior elevations, and building sections.

2.2.2.6. **Accessibility Audit**

- .1 A full facility accessibility audit is generally required for renewal projects of existing City-Owned buildings.
- .2 The City will provide a Facility Accessibility Audit for Existing Buildings - Checklist, for the consultant to use for these purposes.

2.2.2.7. **Historical Review:**

- .1 Provide a Historic Building Record as described in [Design Guidelines Historic Resources](#).
- .2 Provide a Historic Building Condition Assessment as described in [Design Guidelines Historic Resources](#).
- .3 Provide a Conservation Plan as described in [Design Guidelines Historic Resources](#).

2.2.2.8. **Zoning Bylaw and Code Review-**

- .1 For existing buildings;
 - .1 Provide a National Building Code - Alberta Edition, Fire Code, and Life Safety Systems Compliance review, including photos, where possible.
 - .2 Identify a priority of the deficient items on a scale of 1 to 3, 1 being highest priority (for e.g. life safety) and 3 being lowest priority.
 - .3 Recommendations and elaboration on attaining compliance on non-compliant items with a class 4 cost estimate for each item.
 - .4 If any addition is being sought as part of the scope of work, provide a description if the existing building meets Zoning Bylaw rules and regulations for the existing land use area.
- .2 For new construction:
 - .1 Occupancy classification as per the latest Building Code
 - .2 Permitted fire separations and the general construction type(s) of the proposed building

- .3 Any variances that may be applied to the project when applying for municipal permits.
- .4 Description of any Zoning land use area and permitted discretionary or prohibited uses.
- .5 Any regulations or other building codes or standards that need to be considered at the project outset.

2.2.2.9. **Concept Design**

- .1 Confirm with the Project Manager what City-supplied information is available, such as site survey, geotechnical studies, environmental site assessments, parking studies, etc.
- .2 Review the site of the project and assess the suitability of the site to accommodate the City's project. In doing so, take into account known site constraints, ability to support future additions and alterations, and potential impact of proposed developments in the vicinity of the site.
- .3 Building massing studies (provide minimum 3 options)
- .4 Concept and Architectural parti diagrams.
- .5 Structural
 1. List of applicable codes including building importance factor
 2. Use and occupancy loading
 3. Environmental loading forming the Basis of Design
- .6 Mechanical and Electrical systems
 1. Outlines of proposed systems
 2. Innovative Mechanical and Electrical systems should be considered.
- .7 Sustainability
 1. Preliminary review of Policy C627 and related Administrative Procedures refer to Section - [Sustainable Design](#) for further information.
 2. Preliminary review of the City's Specific LEED requirements and discussion of sustainable design strategies.
 3. Building Energy Modelling:
 - .1 Refer to Section - [Sustainable Design](#) for Building Energy Modelling guidelines.
- .8 This submission should include a Class 4 cost estimate. Refer to [Appendix C: Construction Cost Estimates](#).
- .9 This submission shall include a milestone schedule.

2.2.3. **Schematic Design (Client & Technical Review)**

- 2.2.3.1. This phase typically consists of a Schematic Design report with drawings as necessary to illustrate the designs presented. This Schematic Design report may include information from previous design submissions (Concept Design or Functional Programming). The report should

include an estimate with a comparison to the City's construction budget. Note that if no prior submission has occurred, then the deliverables from the previous phase are to be included at this time.

- 2.2.3.2. Should public engagement and communication material be required as part of the Schematic Design stage deliverable, the 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.
- 2.2.3.3. Should Percent for Art be required (refer to your PSA), 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.
- 2.2.3.4. Land Survey: Assist the City in identifying information required from the survey, using a City-Supplied checklist.
- 2.2.3.5. Soils Investigation: Coordinate with the City's Geotechnical and engineering consultants as to the identification of information required from the report, including proposed borehole locations to suit the Project. The Consultant shall incorporate the soil investigation requirements into their Work.
- 2.2.3.6. Toxic and Hazardous Materials Information: Coordinate with the City and the City's Toxic and Hazardous Waste and engineering consultants to identify the scope, work area, and information required from the testing report. The Consultant shall incorporate the City's Toxic and Hazardous Waste and engineering consultants' testing reports and abatement specifications into their Work.
- 2.2.3.7. The Schematic Design 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. Update any Room Data Sheets that were required in the Programming Document.

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.
 - o 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.
 6. 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.
 7. Written summary of barrier-free design for the project including elements that will be incorporated in excess of minimum Code requirements. The intent is to achieve best practices where possible indicated in the latest version of "[City of Edmonton, Access Design Guide](#)".
 8. Summary and responses to the [GBA+ fundamental questions](#).
 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. 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 the 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 an 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.
- .6 Mechanical
1. Design Criteria.
 2. Applicable codes and regulations.
 3. Discussion of proposed utility services.
 4. Description of proposed mechanical systems and approximate system-level heating, cooling, and ventilation design loads in the report.
 5. Discussion of 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. Discussion of the suitability of the space allocated for mechanical systems
 7. Details of any existing equipment or systems intended to be reused.
- .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).
 7. Description of the A/V System operation.
- .8 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)
- .9 Sustainability

1. Building Energy Modelling
 - Refer to Section - [Sustainable Design](#) for Building Energy Modelling guidelines.
2. Preliminary LEED scorecard
3. Response to items identified in LEED Responsibilities items .1 thru .14 including justification where LEED credits identified in the Section - [Specific LEED Credit Requirements](#) may not be pursued.
4. Discuss how the project will meet the requirements of the C627 Climate Resilience Policy. Identify the means and methods of achieving the policy relevant to the applicable Administrative Procedure.
5. Outline any deviations from the Projects [Measurement and Verification Plan](#), if required. Refer to your *Professional Service Agreement*)
6. Provide Life Cycle Costing Evaluation. Refer to the PSA for details.
7. Provide Embodied Carbon Analysis (if required). Refer to the PSA for details.
8. Provide Future Proofing considerations as described in Section - [Sustainable Design](#)

2.2.3.8. Drawing(s) are to include the following but are 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 Site Plan: existing and proposed utility services.
- .2 Plumbing Plan: domestic, storm, and sanitary mains.
- .3 Heating/Cooling Plan: hydronic mains.
- .4 Ventilation Plan: ductwork mains.
- .5 Fire Protection Plan: fire mains.
- .6 Locations of major pieces of mechanical equipment.
- .7 Developed schematics of the following systems:
 - .1 Heating

- .2 Cooling
 - .3 Ventilation
 - .4 Plumbing
 - .5 Pool Systems
 - .6 Arena Refrigeration System
 - .7 Gas Detection
 - .8 Mechanical schematics shall indicate design parameters for inlet and outlet temperatures, pressure, and flow rates where feasible.
 - .9 Mechanical room plan with major equipment positioned and service clearances shown (equipment maintenance and walking paths to access all equipment with a dolly)
- .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 Volume 2 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 Volume 2 Appendix C - Security and Card Access Design Guideline for more information.
 - .8 Preliminary
- .5 Civil / Landscaping / Site Plan
- .1 Preliminary site location of the building and surrounding facilities.
 - .2 Preliminary landscaping plan, including drainage and grading.
- 2.2.3.9. This submission shall include a Class 3 cost estimate. Refer to [Appendix C: Construction Cost Estimates](#).
- 2.2.3.10. This submission shall include a detailed work breakdown schedule to implement the recommended design option.
- 2.2.3.11. 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 EDC presentation date explaining how the project meets the committee's 'Principles of Urban Design' and including drawings and renderings to illustrate the design. Submission requirements can be found on

www.edmonton.ca under “[Edmonton Design Committee](#)”. The content of the Pre-consultation presentation is a draft version of the same information that will be submitted at the Formal Consultation.

- .2 A Powerpoint presentation is to be submitted the Friday before the presentation including the content of the printed booklet (if different than the printed booklet).
- .3 A 15 minute presentation to EDC by the design team, followed by 25 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 the Pre-consultation 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.

2.2.4. Design Development (Client & Technical Review)

- 2.2.4.1. 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.
- 2.2.4.2. 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 Services Agreement* for required public engagement material deliverables.
- 2.2.4.3. 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.
- 2.2.4.4. 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.
- 2.2.4.5. The Design Development 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. The outline specification shall include an itemized list, using brief, concise statements, of significant materials, systems, and equipment and their criteria and levels of quality. Any criteria having a special cost impact must be included.
 - .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 and graphically show the following:
 - .1 Clearly show the intended rooftop working zone(s) on the roof plan. Refer to Vol 2 Roof section for rooftop 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.
 - .10 Refer to Volume 2 - Design loads for Lift Equipment Commonly used by the City.
- .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 Summary and responses to the [GBA+ fundamental questions](#).
 - .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 that 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 the section on [Universal Accessibility](#).
- .11 Provide a description of the proposed Building Envelope systems and explanation of any proposed deviations from the Facility Design & Construction Consultant Manual - Volume 2 “Building Envelope”.
 - .1 Describe where water, snow and ice shed safely.
 - .2 Indicated any internal environmental separations which will be required
 - .3 Indicate minimum effective RSI values for each building envelope system (entire wall).
- .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.
 - .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 Design Criteria.
 - .2 Applicable codes and regulations.
 - .3 Detailed discussion of proposed utility services.

- .4 Complete description of all mechanical systems, equipment, and their associated capacities
 - .5 Present the final system-level heating, cooling and ventilation design loads in the report.
 - .6 Discussion of the suitability of the space allocated for mechanical systems.
 - .7 Details surrounding 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
 - .8 Details of any existing equipment or systems intended to be reused.
 - .9 Discussion of Building Automation System.
 - .10 Description of proposed plumbing fixture types.
 - .11 List of all mechanical equipment to be serviced by emergency power.
- .9 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 Product data sheets on all major components and luminaires.
 - .3 Discussion of LEED concepts and energy efficiency initiatives.
 - .4 Utility service, site generation and major feeder load calculations.
- .10 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.
- .11 Environmental
- .1 Completed “Design Environmental Permit Approval Checklist”. Note all outstanding items that must be determined during detailed design. Refer to section – [Environmental Management \(Enviso\)](#) for more information.
- .12 Sustainability
- .1 Building Energy Modelling
 - .1 Refer to Section - [Sustainable Design](#) for Building Energy Modelling guidelines.
 - .2 Updated LEED scorecard.
 - .3 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 be pursued. Identify requirements for credits that will primarily be the City’s responsibility to achieve.

- .4 Discuss how the project will meet the requirements of the C627 Climate Resilience Policy. Identify the means and methods of achieving the policy relevant to the applicable Administrative Procedure.
- .5 Update outline of any deviations from the Projects [Measurement and Verification Plan](#), if required. Refer to your *Professional Service Agreement*
- .6 Provide any changes/updates to Life Cycle Costing Evaluation .
- .7 Provide any changes/updates to the Embodied Carbon Analysis (if required).
- .8 Provide Future Proofing considerations as outlined in section - [Sustainable Design](#).

2.2.4.6. 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), OH&S/Work at Height 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 Site Plan: utility service connections, utility service sizes, utility meter, and fire department connections.

.2 Roof Plan: locations of drains, rooftop equipment, and air intake and exhaust locations.

.3 Plumbing Plan: fixtures, floor drains, cleanouts, plumbing, and drainage mains.

.4 Heating / Cooling Plan: hydronic mains, branch lines, and layout of any terminal units.

.5 Ventilation Plan: single line distribution mains and layout of terminal units.

.6 Fire Protection Plan: fire mains, fire protection zone boundaries, and sprinkler tree location.

.7 Show locations of major pieces of mechanical equipment.

.8 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.

.9 Mechanical schematics shall indicate design parameters for inlet and outlet temperatures, pressure, and flow rates where feasible.

.10 Mechanical schematics to show all building automation devices including those that measure air and water flow, temperature, and pressure along with any control devices such as control valves or balancing dampers.

.11 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.
- .3 Any piping or ductwork in the mechanical room larger than 4" shall be shown as double line to indicate true size.
- .4 Pool Design: Coordinate and show all main piping and equipment, including pumps, filters, surge tank, chemical treatment, and pool inlets and outlets.
- .5 Arena Design: Coordinate and show all main piping and equipment including pumps, chillers, cooling towers, fluid coolers, etc.
- .6 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 System 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, audio visual systems public address, etc.
 - .9 Preliminary audio visual system paging zone layout.
 - .10 Preliminary structured wiring riser diagram that clearly demonstrates all major components and their interrelation.
 - .11 Preliminary plan layouts of the Network Access Room(s) showing all major equipment.
 - .12 Illumination levels and uniformity calculations for all interior spaces; include photometric, isolux layout in drawings.
 - .13 Target interior and exterior lighting power densities.

.14 Service Drawing indicating lift path from outside through building and reviewed by a Structural Engineer for floor loading.

.15 Lightning Protection Risk Assessment as per CSA B72.

.7 Landscape / Civil / Site

1. Landscape plan and site details as per development permit application requirements.

2.2.4.7. This submission shall include a Class 3 cost estimate. Refer to [Appendix C: Construction Cost Estimates](#).

2.2.4.8. This submission shall include an updated detailed work breakdown schedule.

2.2.4.9. Between the midpoint and end of Design Development, the Consultant will prepare presentations for Informal and Formal Consultations with the Edmonton Design Committee (EDC) as per the requirements listed on the [EDC website](#). 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-Consultation, with the following exceptions:

- .1 The Development Permit Application is to be submitted to the Development Services, Urban Planning and Economy Department at least one week prior to the Formal Consultation with EDC.
- .2 The presentation content shall show how the comments from the Pre-Consultation were addressed.
- .3 The meeting is public.
- .4 The committee will ask questions and may make comments on some areas for design improvement.
- .5 Formal Response from the committee is given within 48 hours of the presentation in the form of a letter. The response will be either support, support without conditions, or non-support. In the case of Non-Support or Support with Conditions, the EDC comments and conditions become part of the development permit response and will need to be addressed with the development officers of the Development Services, Urban Planning and Economy Department.

2.2.5. Working Documents – Progress Submission (Client & Technical Review)

2.2.5.1. 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.

2.2.5.2. 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.

2.2.5.3. The Progress Submission(s) are to include the following:

.1 Architectural & Interior Design

- .1 Zoning and Code summary.
- .2 Fire Separations to be indicated on plans.
 - .1 Acoustic separation to be indicated on plans
 - .2 Indicate minimum effective RSI values required by code for each building envelope system.
- .3 General notes.
- .4 Partition assembly legend. Exterior and interior wall types are listed.
 - .1 Indicate minimum effective RSI value.
- .5 Site plan.
- .6 All Plans included and are to be substantially complete. This includes floor plans, reflected ceiling plans, roof plan, and updated OH&S/Work at Height Plan(s) - see below.
- .7 All equipment and furniture locations are shown.
- .8 Exterior Elevations, all located and drawn. Notes to be substantially complete.
- .9 Building Sections, all located and drawn. Notes to be substantially complete.
- .10 Wall Sections, all located and drawn. Notes to be substantially complete.
- .11 Enlarged plans for areas such as bathrooms, kitchens, and other specialty areas, all located and drawn.
- .12 Plan details: Typical shown. Atypical located but may not be detailed.
- .13 Section details: Typical shown. Atypical located but may not be detailed.
- .14 Room finishes schedule/drawing to be substantially complete. Show patterns for finishes in drawing, if applicable.
- .15 Doors and windows schedule to be substantially complete.
- .16 Interior Elevations, all located and drawn.
- .17 Millwork Plans, Elevations, and sections. Millwork details are located but may not be complete.
- .18 All work by other disciplines presented in this submission has been coordinated.
- .19 Specification sections for all building assemblies should be included.
- .20 Submission of list of miscellaneous metal elements within the (Metal Fabrication 05 50 00) requiring fabrication. This section shall be coordinated with all sub disciplines on the team.
- .21 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.

.22 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 (if approved for use, see Volume 2)
 - .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. Refer to Vol 2 - Design Loads for commonly used City 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.

.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 Column schedule created and elevations/sections 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 the 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 Title page and list of mechanical drawings.
 - .2 Mechanical Legend.
 - .3 Site Plan: utility service connections and sizes, pertinent inverts, and natural gas schedule showing all loads.
 - .4 Roof Plan: locations of all roof top equipment, drains, plumbing vents, air intakes, and exhausts, etc.
 - .5 Plumbing Plan: fixtures, floor drains, cleanouts, plumbing and drainage mains with sizes. Also plumbing fixture tags.
 - .6 Heating / Cooling Plan: hydronic mains, branch lines, valves, and layout of any terminal units with sizes. Include terminal unit tags.
 - .7 Ventilation Plan: ductwork distribution mains and branches and layout of terminal units with sizes. Also diffuser and register locations and tags and dampers.
 - .8 Fire Protection Plan: fire mains, fire protection zone boundaries, and sprinkler tree location with sizes. Sprinkler head locations if needed.
 - .9 Developed mechanical system schematics (to be separate from the plan drawings).
 - .1 Heating
 - .2 Cooling

- .3 Ventilation
- .4 Plumbing
- .5 Pool Systems
- .6 Arena Refrigeration System
- .7 Gas Detection
- .10 Mechanical schematics shall indicate design parameters for inlet and outlet temperatures, pressure, and flow rates where feasible.
- .11 Mechanical schematics to show all building automation devices including those that measure air and water flow, temperature, and pressure along with any control devices such as control valves or balancing dampers.
- .12 Riser diagrams for piping and ventilation systems for any building with four or more levels (above or below ground).
- .13 Mechanical room drawings shall show the following:
 - .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 a 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 and there shall be notes indicating that no other equipment or piping is allowed in these spaces.
 - .3 Where mechanical room drawings are modelled in three dimensions (3D), isometric views shall be shown on drawings.
- .14 Gas detection plan drawing shall show locations for all sensors, controllers, strobes, horns, and signage.
- .15 Proposed standard details for the project.
- .16 Complete and detailed control systems sequence of operations for all mechanical equipment to be included. Sequence to include which mechanical equipment is to be turned off in a fire alarm.

- .17 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.
 - .18 Coordinate location and access requirements for maintenance of equipment mounted within or concealed above finished ceiling space with Architectural Consultant.
 - .19 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.
 - .20 Large units, such as fan coils, should be aligned with finished ceiling orientation to avoid clashes with regards to maintenance access and ceiling framework. Coordinate orientation with Architectural Consultant as appropriate.
 - .21 Draft revision of all relevant specification sections. Sections may still need to be edited, but all necessary sections have been provided.
- .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, audio visual system(s), security, low voltage/lighting controls, and structured wiring.
 - .10 Preliminary audio visual system design calculations. Provide network bandwidth and POE power budget calculations.

- .11 Electrical details, including utility transformer installation details, trenching/underground installations, equipment installation details, grounding/bonding details, and control diagrams.
- .12 Preliminary panel schedules. Final circuiting is not required in this submission.
- .13 Luminaire schedule.
- .14 Preliminary low voltage panel schedules.
- .15 Preliminary motor schedule, coordinated to the same progress level as the mechanical submission.
- .16 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.
- .17 Working specification, edited to include only those products and methods applicable to the project.
- .18 Schedules may appear in either the drawings or specifications.
- .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 Building Energy Modelling
 - .1 Refer to Section - [Sustainable Design](#) for Building Energy Modelling guidelines.
 - .7 This submission should include a Class 2 cost estimate. Refer to [Appendix C: Construction Cost Estimates](#).

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

- 2.2.6.1. 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 shall be based on the latest approved design submission and the City's Construction Budget. 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.

- 2.2.6.2. 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.
- 2.2.6.3. The Pre-Bid Submission is to include the following:
 - .1 Architectural & Interior Design
 - .1 All items in the previous submission, and any outstanding items, 100% complete, with comments from previous submissions addressed.
 - .2 The updated Work at Height Plan is to be included in the construction documents for "information only"; the intention is for this plan to be included in the final Operation and Maintenance Manuals turned over to the City.
 - .3 Complete all schedules, including door, frame, hardware, glazing, and interior finishes.
 - .4 All furniture, equipment, and fixtures shall be coordinated to ensure appropriate backing and power supply. Consultant work shall clearly indicate which items are;
 - .1 owner supplied and installed (Not In Contract)
 - .2 owner supplied, contractor, installed.
 - .3 the contractor supplied and installed (In Contract).
 - .5 All coordination with other disciplines is 100% complete.
 - .2 Structural
 - .1 All items in the 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 General notes are edited and project specific.
 - .2 All drawings are fully complete with all sizes and technical information.
 - .3 Title page and list of mechanical drawings.
 - .4 Mechanical Legend.
 - .5 Site Plan: utility service connections and sizes, pertinent inverts, and natural gas schedule showing all loads

- .6 Roof Plan: locations of all roof top equipment, drains, plumbing vents, air intakes and exhausts, etc.
- .7 Plumbing Plan: fixtures, floor drains, cleanouts, plumbing and drainage mains with sizes. Also plumbing fixture tags.
- .8 Heating / Cooling Plan: hydronic mains, branch lines, valves, and layout of any terminal units with sizes. Include terminal unit tags and thermostats.
- .9 Ventilation Plan: ductwork distribution mains and branches and layout of terminal units with sizes. Also diffuser and register locations and tags and dampers.
- .10 Fire Protection Plan: fire mains, fire protection zone boundaries, and sprinkler tree location with sizes. Sprinkler head locations if needed.
- .11 Developed mechanical system schematics (to be separate from the plan drawings).
 - .1 Heating
 - .2 Cooling
 - .3 Ventilation
 - .4 Plumbing
 - .5 Pool Systems
 - .6 Arena Refrigeration System
 - .7 Gas Detection
- .12 Mechanical schematics shall indicate design parameters for inlet and outlet temperatures, pressure, and flow rates where feasible.
- .13 Mechanical schematics to show all building automation devices including those that measure air and water flow, temperature, and pressure along with any control devices such as control valves or balancing dampers. Show on drawings the required manufacturer's recommended diameters of pipe both before and after any flow meter.
- .14 Equipment, components, piping and ductwork shall be arranged to accurately reflect the physical (on-site) configuration including equipment connections, valves and dampers.
- .15 Riser diagrams for piping and ventilation systems for any building with four or more levels (above or below ground).
- .16 Standard details edited and project specific. There shall be details for every piece of terminal equipment including VAV boxes, fan coils, radiant panels, etc. There shall be a detail for every major piece of equipment including boilers, chillers, air handling units, etc. There shall be a detail for all relevant control and balancing devices. Details to include piping and ductwork connections.
- .17 Mechanical room drawings shall show the following:

- .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 a minimum of two (2) section views to clearly illustrate equipment heights, pipe and duct heights and clearances, vertical clearances etc.
 - .3 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.
 - .4 Equipment service space requirements are to be shown on the drawings and there shall be notes indicating that no other equipment or piping is allowed in these spaces.
 - .5 Where mechanical room drawings are modelled in three dimensions (3D), isometric views shall be shown on drawings.
 - .6 Full coordination of mechanical details with architectural, civil, structural, and electrical design elements must be clearly identified.
 - .18 Equipment schedules included and fully complete.
 - .19 Schedule of control valves complete with Cv, install location, size, and service.
 - .20 Complete and detailed control systems sequence of operations for all mechanical equipment to be included. List of BAS Control points has been included, complete with input/output type.
 - .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 clashes with regards to maintenance access and ceiling framework. Coordinate orientation with Architectural Consultant as appropriate.
 - .22 Complete, fully edited, set of specifications.
- .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 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 section – [Environmental Management \(Enviso\)](#) for more information.
 - .7 Building Energy Modelling
 - .2 Refer to Section - [Sustainable Design](#) for Building Energy Modelling guidelines.
- 2.2.6.4. The Pre-Bid submission should include a Class 1 cost estimate. Refer to [Appendix C: Construction Cost Estimates](#).
- 2.2.6.5. Note: Responding to reviews done by COE will not relieve consultants to provide COE 100% complete set of drawings and specifications for the competitive bidding process. The Construction documents should be complete in all respects for the general contractor to price it accurately and in a timely manner.

2.2.7. Bid and Construction Documents

- 2.2.7.1. The Bid documents 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 shall incorporate all review comments from the Pre-bid review, and use the title “Issued for Tender”
- 2.2.7.2. The Consultant shall, when describing products and processes, use terms that are standard in the industry and are consistent between the drawings and specifications.
- 2.2.7.3. 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.
- 2.2.7.4. The Consultant shall obtain contract document sign-off by the City prior to the contract documents being issued for bids.
- 2.2.7.5. The Consultant shall ensure that all disciplines authenticate “Issued for Tender” drawings and specifications in accordance with the AAA/APEGA practice standards.
- 2.2.7.6. 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.

- 2.2.7.7. “Issued for Construction” documents are required when *consequential changes* occur to the bid documents that impact the integrity of the design and/or require input and approval from the authenticating professional are made by addendum during the bidding process. “Issued for Construction” documents are to incorporate all addenda and revision items up to the date, and be authenticated in accordance with the AAA/APEGA practice standards.

2.3. Drawing and Document Standards

2.3.1. References

- 2.3.1.1. *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

- 2.3.2.1. Introduction
- 2.3.2.2. The drawing standards outlined in the "[CAD Drawing Standards](#)" section are to be followed for all projects.
- 2.3.2.3. 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

- 2.3.3.1. 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.
- 2.3.3.2. 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.
- 2.3.3.3. 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.

2.3.3.4. 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 Proofread 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

2.3.4.1. 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.

2.3.4.2. Specifications

- .1 Unless specifically allowed by the City on a project, specifications on drawings are not permitted. All specifications are to be in the 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 specifications 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. The font shall be Arial, 11 pt.
- .4 The final specification is to be submitted in PDF format on an 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.

2.3.4.3. 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.

2.3.4.4. Submittals Registry

- .1 Prepare a submittals registry prior to construction start-up, to be handed over to the Prime Contractor. The Consultant shall distribute the Submittals Registry at the Construction Start-up Meeting, and review and update the status of all submittals in the registry at all regular construction meetings.
- .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.

2.3.4.5. Site Instructions, Contemplated Change Orders, Change Orders and Change Directives

- .1 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.
- .2 Sketches or drawings accompanying Site Instructions and Change Orders, if these constitute a change to previously authenticated drawings; or are additions/changes to the contract documents, they shall be authenticated in accordance with AAA/APEGA practice standards.

2.3.4.6. Meeting Minutes

- .1 Record the minutes for project (design and construction) meetings.
- .2 Include a list of attendees with contact information, location and time of the 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 Distribute meeting minutes within three (3) Working Days after each meeting. Transmit to meeting participants, affected parties, not in attendance, and the City. The City will distribute the design and construction start-up meeting minutes.

.5 Construction meeting agendas and the subsequent minutes shall include the following attachments. Any outstanding items shall include review/commentary from the consultant:

- 2 week look ahead (supplied by contractor)
- 6 week look ahead (supplied by contractor)
- Safety and Environmental stats (supplied by contractor)
- Submittals registry
- Shop drawing log
- Site Instruction log
- Request for Information log
- Contemplated Change Order, Change Order, and Change Directive log
- Commissioning Issues and resolution log (if required)
- Progress claim status

2.3.4.7. Field Reviews Reports

- .1 Include date, time, weather conditions, the person(s) performing inspection, date of the previous review.
- .2 Indicate system(s) being reviewed.
- .3 Note the reason for review (progress, mock-up, rough-in, substantial completion, occupancy, warranty, etc).
- .4 Give a description of construction progress, as it relates to the system(s) being reviewed. Indicate progress since the previous review.
- .5 Note specific deficiencies and action items. Include a 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 The frequency of field reviews should occur at regular intervals and at specific milestones as defined in the *Professional Service Agreement*.
- .9 Field review reports are to be distributed within 3 business days of the date of site review. Time-sensitive review items are to be addressed verbally to the Project Manager at the time of field review.

2.3.5. Drawing Quality Guidelines

- 2.3.5.1. 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.

- 2.3.5.2. 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.
- 2.3.5.3. 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 the entire drawing set, including sub-disciplines.
 - City of Edmonton Facility Inventory Management (CAFM) group shall be contacted to secure approved floor naming and room numbering scheme; email "fim@edmonton.ca" or "caf@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:
 - 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.
 - 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.
 - Use general notes for information that applies to the entire drawing or group of drawings.
 - 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.
 - When using standard details or drawing templates, delete all notes that do not apply to the specific project.
 - 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

- 2.3.6.1. Drawings shall generally 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")
- 2.3.6.2. 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.
- 2.3.6.3. 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; if there are any questions or difficulties contact the Project Manager for assistance or referral.
 - .2 Version control shall follow the Issue and Revision scheme defined in the 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.
- 2.3.6.4. 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 complexity of the design.
- 2.3.6.5. 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.
- 2.3.6.6. 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

- 2.3.7.1. Drawings not complying with the following requirements will be returned for resubmission.
- 2.3.7.2. 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.
- 2.3.7.3. Drawings in AutoCAD format may be requested, prior to the Record Drawing stage, for use by the City of Edmonton or a Contractor. If so, these DWG files shall be provided as per the Record Drawing section requirements below.
- 2.3.7.4. Record Drawings
 - .1 The City of Edmonton requires Record Drawings to 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.
 - 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 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.
 - 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.
 - 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.
 - 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.]”.
 - 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.
 - In particular, the City expects accurate parametric equipment data export tables congruent with CoBIE standards. Currently, any model(s) must also be supplied in IFC (Industry Foundation Class) format. Note that this is in addition to the CAD & PDF 2D sheets.
- 2.3.7.5. Submit all files on an optical disc, memory stick, portable drive, or via file sharing system for City of Edmonton download.
 - 2.3.7.6. Confirm with the Project Manager if any supplementary hard copies are required.

2.4. **Edmonton Design Committee**

2.4.1. **General**

- 2.4.1.1. 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.
- 2.4.1.2. The consultant will be required to give a pre-consultation and formal presentation to the EDC for all new buildings.
- 2.4.1.3. For addition and renovation projects, the consultant may be required to participate in a pre-consultation and formal presentation to the EDC, as directed by the Project Manager on a case-by-case basis. In general, interior renovation projects are not required to be presented to EDC, while renovations that affect the site, the exterior of the building, and require a development permit are required to be presented to the committee.
- 2.4.1.4. All information regarding the Edmonton Design Committee can be accessed from the City of Edmonton webpage.
- 2.4.1.5. The deliverables required for presentations to the EDC are available on the City of Edmonton website (Link to the EDC web site: https://www.edmonton.ca/city_government/city_organization/edmonton-design-committee), with their timing within the design process outlined in the section - [Consultant Deliverables](#) of this Manual.

3 Design Guidelines & Reference Standards

3.1. Sustainable Design

3.1.1. Introduction

C627 Climate Resilient Policy aligns with the strategic goals of Climate Resilience in ConnectedEdmonton, the Big City Move of Greener as we Grow in City Plan, and the City leadership actions that are set out in the Revised Energy Transition Strategy.

The Procedures include requirements for Emission Neutral Buildings for all new construction at the City, development of an Emissions Neutral Building Framework for our existing building portfolio, requirements for programs and projects that support the continued improvement of the climate resilience of City buildings through operation and maintenance, clarity on roles and responsibilities and expectations for all Procedures but most specifically with regards to the way we purchase and lease buildings.

The goal of transforming Edmonton's building stock to be emissions neutral is stated in the Policy as follows:

The City of Edmonton will ensure proactive leadership in climate solutions by taking a lead role in promoting and supporting Edmonton's climate resilience efforts and leading by example in its own civic operations. For Buildings, this means, immediately adopting sustainable and resilient building practices for the buildings it owns, leases and funds, over the course of their entire lifecycle through: 1) the design and construction of Emission Neutral, climate ready buildings; 2) monitoring, benchmarking, operating, and maintaining City buildings, and 3) proactively retrofitting existing City buildings to reduce their carbon emissions and to prepare for a changing climate.

The implementation of this policy will be realized through a collaborative and holistic planning approach to the development of a project's scope, program, and its current condition (if rehab project).

The [City of Edmonton](#) website provides the latest adopted edition of the City of Edmonton Policy C627 Climate Resilience Policy and Administrative Procedures:

- *Climate Resilient Design and Construction of City Buildings*
- *Climate Resilient Existing City Buildings*
- *Climate Resilient Acquisition of City Buildings*
- *Climate Resilient Building Leasing - City as Landlord*
- *Climate Resilient Building Leasing - City as Tenant*
- *Climate Resilient City-Funded, Non-City Owned Buildings.*

3.1.2. References

- 3.1.2.1. Latest adopted edition of Canadian Green Building Council, *LEED Canada NC (New Construction) Green Building Rating System*.
- 3.1.2.2. [Climate Resilient Edmonton Adaptation Strategy and action plan, 2018](#)
- 3.1.2.3. [Community Energy Transition Strategy Implementation progress report, April 2021](#)
- 3.1.2.4. City of Edmonton, Technical Memorandum PIEVC Lite Assessment - Facilities Risk Assessment, March 2021.

3.1.3. Emissions Neutral Building Requirements

- 3.1.3.1. This section outlines the recommended procedure for demonstrating that a building is emissions neutral:
 - .1 Utilizing the building energy model, determine the amount of annual greenhouse gases (in tonnes CO₂) produced by the building from electricity end uses. This value is determined by taking the annual electricity consumption of the building and multiplying it by the current electricity grid emissions factor found in 4.14 of the Facility Design and Construction Consultant Manual Volume 2.
 - .2 Utilizing the building energy model, determine the amount of annual greenhouse gases (in tonnes CO₂) produced by the building from fossil fuel end uses (if applicable). This value is determined by taking the annual natural gas consumption of the building and multiplying it by the natural gas emissions factor found in 4.14 of the Facility Design and Construction Consultant Manual Volume 2.
 - .3 Combine the values from step 1 and step 2 above, to determine the total annual greenhouse gas emissions generated by the building.
 - .4 Determine the amount of greenhouse gas emissions that can be offset by on site renewable energy systems (eg. photovoltaics). This value is determined by taking the annual electricity generated by on-site renewable energy system(s) and multiplying by the current electricity grid emissions factor found in 4.14 of the Facility Design and Construction Consultant Manual Volume 2.
 - .5 Subtract the amount of annual greenhouse gases offset by the renewable energy system from the total annual greenhouse gas emissions generated from the building. The result must be less than or equal to 0 to meet the emissions neutral requirement.
- 3.1.3.2. If there is not enough on-site renewable energy to offset the annual emissions generated from the building, confirm with the City that the utilities provided to the building are 100% renewable.
- 3.1.3.3. Do not include emergency or backup systems in greenhouse gas emissions calculations.
- 3.1.3.4. Verify the design is emissions neutral at the design development stage before construction documents begin.
- 3.1.3.5. Verify the design is emissions neutral at the final construction documents progress review.

3.1.4. Energy Modelling

3.1.4.1. Concept Design

- .1 Assess the impact of up to three massing options presented by the Architect, and provide feedback on the following metrics:
 - Relative energy use, broken down by end-uses heating, cooling, lighting, and ventilation.
 - Renewable energy potential, as applicable from the project's RFP.
 - Alignment of City goals as defined in the RFP (NECB energy and GHG savings, Annual Heating Demand, etc.)
- .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, the 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 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 and GHG emissions factors shall be provided by the City. 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.

3.1.4.2. Schematic Design

- .1 The Building Energy Consultant shall create an energy model as per the description provided in Concept Design above. Or, as applicable, update the model and the report prepared during the concept design phase with any additional information that has become available since that time. The updated report completed during the schematic design phase shall also include:
 - 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)
 - Daylight potential and excessive illuminance levels (i.e. glare) in zones of interest, as

determined by the City and/or Architect

- The model shall also take into account the daylighting potential of the building by directly modeling the impact of daylight sensors in applicable zones.
- Energy use, broken down by end uses (at minimum heating, cooling, lighting, plug loads, fans, and pumps)
- Energy Cost, broken down by end uses and Utility (including utility rates used)
- Peak delivered heating and cooling for the building and for the worst performing zones
- City compliance metrics and targets (NECB savings, LEED v4 savings, EUI, GHG emissions)
- Window performance, based on Solar Heat Gain Coefficient, Visible Transmittance, and overall U-value (including framing)
- Roof performance
- Lighting power density ranges, as appropriate, but not less than 3 levels
- Up to 2 mechanical system types (i.e. Air-based heating and cooling with recirculation versus 100% OA with Radiant Heating)
- List of equipment efficiencies for mechanical equipment.
- Impact of potential renewable energy options, as applicable in the RFP
- 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.)

3.1.4.3. Design Development

- .1 The building energy model and report shall be updated with all subsequent changes made since schematic design, including details to address potential thermal bridging as required by NECB 2017.

3.1.4.4. Working Documents - Progress Reviews

- .1 Building Energy Consultant to review drawings and specifications and update model and associated energy report with any subsequent changes
- .2 For Building Permit, the Building Energy Consultant shall provide all documentation required by The City of Edmonton, Inspections, and Permits.

3.1.5. Life-Cycle Cost Analysis

- 3.1.5.1. Refer to your *Professional Service Agreement* for additional detailed information regarding services and formats of deliverables related to Life-Cycle Cost Analysis.

3.1.6. Greenhouse Gas (GHG) Energy and Cost Tracking - Existing Buildings

- 3.1.6.1. Rehabilitation is intended to provide like-for-like replacement or upgrades to various systems and components that are at the end of their lifecycle or in critical condition. Within the scope of work

that is identified for the Rehab project, the Consultant shall support the City in identifying scopes of work that have greater potential to impact energy consumption (i.e., more than 2.5%+/- against existing equipment).

- 3.1.6.2. Options are to be developed that balance the requirements for lifecycle replacement, energy efficiency, and cost. The City is interested in understanding the incremental impact to emissions and costs of completing the energy savings scope. Where replacement of certain components are in-scope, a comparison should be made between a “base” conventional approach for the identified scope of work (which assumes that some ECMS are already identified as part of the Rehab scope); and a higher performance approach. This should be considered for each applicable scope item.
- 3.1.6.3. Refer to your *Professional Service Agreement* for additional detailed information regarding services and formats of deliverables related to GHG Energy and Cost Tracking.

3.1.7. Embodied Carbon Analysis

- 3.1.7.1. Refer to your *Professional Service Agreement* for additional detailed information regarding services and formats of deliverables related to the completion of an Embodied Carbon Analysis.

3.1.8. Measurement and Verification Plan

- 3.1.8.1. The City will provide Project specific measurement and verification plans for the renewal project, if applicable. Inquire with your Project Manager if one has not been provided.
- 3.1.8.2. Refer to your *Professional Service Agreement* for detailed information regarding services and format of deliverables related to implementing, and reporting deviations on the Project's Measurement and Verification Plan.

3.1.9. Climate Risk and Vulnerability Assessments

- 3.1.9.1. The purpose of this assessment is to provide an understanding of what a facility project could face due to climate change. Identifying the key climate-based risks, and vulnerability to those risks will assist the City in making decisions regarding infrastructure planning and design.
- 3.1.9.2. This scope of work is to complement the work required for [Specific LEED Credit IPpc98](#) Assessment and Planning for Resilience and must be substantially complete in pre-design.
- .1 Review the City's provided Hazard Assessment '*City of Edmonton, Technical Memorandum PIEVC Lite Assessment - Facilities Risk Assessment, March 2021*' to understand the types of climate change risks the project may face.
- Provide a written response to the Hazard assessment, documenting the climate risks this specific facility may face.
 - Identify flood risks specific for the building including identification of low grading, natural topography.
 1. Obtain a flood map from EPCOR to evaluate site specific risk of flooding.

2. Using the City's PIEVC Lite Assessment as a starting point, provide a facility specific detailed climate risk assessment for its specific site features, building materials, and systems.

.2 Conduct a site-specific Vulnerability Assessment

- "Vulnerability refers to the susceptibility of assets and services to be impacted by climate change; it is the function of the nature and magnitude of the impact the asset or service is exposed to, the sensitivity to that exposure, and the adaptive capacity of the asset or service" ([Climate Resilient Edmonton Adaptation Strategy and action plan](#))
- Conduct a charette to solicit input from the City to identify the degree, likelihood, and consequences should a system be unable to cope with climate change impacts, variability, and extremes over time. Consequences shall consider project goals, program, and intended service for the life of the building and be quantified across four different categories and consider:
 1. Health and Safety
 2. Economy
 3. Social Wellbeing
 4. Natural Environment

.3 Using the Engineers Canada's PIEVC (Public Infrastructure Engineering Vulnerability Committee) protocol is seen as an asset.

- 3.1.9.3. This scope of work is to complement the work required for [Specific LEED Credit](#) IPpc 99 Designing for Enhanced Resilience and must be substantially complete in pre-design.

- .1 Provide site specific options for how the facility could be designed and constructed to resist, with minimal damage, reasonably expected climate risks. (refer to page 25-26 of the 'City of Edmonton, Technical Memorandum PIEVC Lite Assessment - Facilities Risk Assessment, March 2021')

3.1.10. Future Proofing

- 3.1.10.1. Section 3.6 of the Climate Resilient Design and Construction of City Buildings Administrative Procedure states:

"New City Owned, Occupied Buildings will be designed and constructed in a manner that provides flexibility to plan for and incorporate reasonably foreseeable emerging technology installations. For example solar-ready Buildings to suit installations that meet the City of Edmonton Solar Photovoltaic Program Design Guideline, provisions for future geothermal, energy storage, low or Carbon Neutral energy, district energy nodes and connectivity where appropriate and as identified in the City of Edmonton's Facility Design and Construction Manuals."

The intent of this checklist is to help design teams identify "reasonably foreseeable emerging technology installations" that should be considered. As identified in the below checklist, if a design requirement is triggered, but is not being considered in the design, the team must clearly justify

the reason. Similarly, there may be options for the extent of infrastructure needed to facilitate future technology and those options should likewise, be presented for consideration.

3.1.10.2. The report deliverable should include strategic considerations and lifecycle cost benefit justification if appropriate. Future proofing considerations should be included in the sustainability section of the Schematic Design Report and updated accordingly in the Design Development Report. At these key milestones and in the case where a design requirement is triggered, but is not being considered in the design, justification should be made to the Climate Resilient Building Team (CRBT). If there is a disagreement between the design team and the CRBT regarding application the team should follow the procedure exception process.

3.1.10.3. Future Proofing Table:

Potential Future System	Triggers	Requirement
Community-Generation Potential on Solar-ready Buildings	<ul style="list-style-type: none"> Is there roof area available to support the installation of additional solar panels, (over and above emissions neutral)? Is there a potential for an additional onsite or community generation project to be installed? <p><i>Note 1: Assume that buildings are already designed to be an emissions neutral building.</i> <i>Note 2: Assume that the existing solar installation meets the maximum capacity allowed by the micro-generation regulation set out by the Provincial Government.</i></p>	<ul style="list-style-type: none"> Installations shall meet the <i>City of Edmonton Solar Photovoltaic Program Design Guideline</i> What is the added future benefit? (cost of additional capacity + cost of related building infrastructure, vs added value to community (GHG reductions or energy \$ credits?)) What are the implications to the current design to realize this added benefit?
Provisions For Future Geoexchange	<ul style="list-style-type: none"> Is there an available site area that is appropriate for deep or shallow geothermal fields Is there an intent for a future scenario to allow a switch from a gas heating system to a geothermal heating system? Is there an intent to accommodate a future building expansion? <p><i>Note: Assume that buildings are already designed to be an emissions neutral building.</i></p>	<ul style="list-style-type: none"> The existing heating systems (assume gas fuel source) utilizes a heating system (such as hydronic) that can be transitioned to geothermal
Energy Storage	<ul style="list-style-type: none"> Is there on-site energy generation? (example: solar, geothermal/alternative heat 	<ul style="list-style-type: none"> Evaluate potential energy storage solutions to meet emergency heating and

	<p>exchange system, RNG, or other,?)</p> <ul style="list-style-type: none"> • Is there an emergency back-up power system required? 	<p>power requirements, and evaluate potential off-sets for peak power draw.</p> <ul style="list-style-type: none"> • Identify what additional space requirements may be required and determine potential space availability for storage. • Identify other infrastructure requirements needed that may be difficult to update after initial construction.
Low or Carbon Neutral energy	<ul style="list-style-type: none"> • Is the building planned to utilize a higher emissions energy source (e.g. Natural Gas, grid electricity, diesel)? 	<ul style="list-style-type: none"> • Plan space and infrastructure for new equipment or fuel source to replace carbon emitting /using equipment.
District Energy Nodes And Connectivity Etc.	<ul style="list-style-type: none"> • Is the facility planned to be within one of the potential district energy nodes? • Is DE a feasible option for this building? 	<ul style="list-style-type: none"> • Ensure space for DE system connections is planned for and potential phase out of existing equipment is possible. • Confirm if the district energy system is compatible with what is planned for this facility? Or, is there a transition strategy?

3.1.11. Specific LEED Credit Requirements

3.1.11.1. 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 Integrative Process
- .2 Sensitive Land Protection
- .3 Bicycle Facilities (pursued on facility side even if bike network not available)
- .4 Site Assessment
- .5 Open Space

- .6 Heat Island Reduction (pursued on roof even if non-roof measures cannot be implemented to fulfill credit)
- .7 Outdoor Water Use Reduction
- .8 Indoor Water Use Reduction
- .9 Cooling Tower Water Use / ID Pilot: No cooling tower
- .10 Water Metering
- .11 Enhanced Commissioning, including monitoring-based commissioning
- .12 Optimize Energy Performance (meet C627 energy performance minimums)
- .13 Advanced Energy Metering (M&V)
- .14 Renewable Energy Production (meet C627 requirements)
- .15 Enhanced Refrigerant Management
- .16 Construction & Demolition Waste Management
- .17 Enhanced Indoor Air Quality Strategies
- .18 Low-Emitting Materials
- .19 Construction Indoor Air Quality Management Plan
- .20 Indoor Air Quality Assessment
- .21 Thermal Comfort
- .22 Interior Lighting
- .23 Acoustic Performance
- .24 ID: Green Building Education
- .25 IP: LEED Pilot credits relating to Climate Resilience:
 - Assessment and Planning for Resilience (Prerequisite)
 - Designing for Enhanced Resilience

3.1.11.2. 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 Reduced Parking Footprint
- .2 Green Vehicles
- .3 Light Pollution Reduction
- .4 Indoor Water Use Reduction
- .5 Enhanced Commissioning (Envelope Commissioning)
- .6 Demand Response

- .7 Renewable Energy Production
 - .8 Enhanced Indoor Air Quality Strategies
 - .9 Daylight
 - .10 Quality Views
 - .11 IN: Community Outreach & Involvement
 - .12 IN Pilot: Ergonomics Approach
 - .13 **Passive Survivability and Back-up Power During Disruptions**
- 3.1.11.3. On projects designed to achieve LEED certification, these credits are potentially attainable based on site location:
- .1 High Priority Site
 - .2 Surrounding Density & Diverse Uses
 - .3 Access to Quality Transit

3.1.12. LEED Responsibilities

- 3.1.12.1. 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

3.2.1.1. General

- .1 All new buildings and additions are to be universally accessible (barrier-free, gender inclusive, age-friendly).
- .2 All renovations and upgrades shall strive to achieve the highest level of universal accessibility feasible for that project.

3.2.1.2. References

- .1 Required References:
 - National Building Code, latest Alberta Edition.
 - [City of Edmonton Policy C602: Accessibility for People with Disabilities](#)
 - [Administrative Procedure: Accessibility for People with Disabilities](#)
 - [City of Edmonton Access Design Guide](#)
- .2 Recommended References:
 - “Barrier-free Design Guide”, Barrier-free Design Advisory Committee of the Safety Codes Council and with the assistance of Alberta Municipal Affairs.
 - CAN/CSA-B651-18, Accessible design for the built environment.
 - Clearing Our Path, Creating accessible environments for people impacted by blindness, CNIB foundation

3.3. Corporate Space Guidelines

3.3.1. General

- 3.3.1.1. 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.
- 3.3.1.2. The Consultant shall work with City Workplace Accommodations to understand office space requirements.

3.4. Percent for Art Process

3.4.1. General

- 3.4.1.1. The latest adopted version of the Percent for Art City Policy C458c is available on 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.
- 3.4.1.2. The Public Art procurement process is managed by the Edmonton Arts Council (EAC). The process for commissioning an artwork varies depending on the capital project scope and available art budget.
- 3.4.1.3. The Project Manager will arrange an introductory meeting between the consultant and the Edmonton Arts Council at the beginning of the Schematic design to discuss the public art approach in the context of the capital project scope and timeline. Another meeting should be arranged with the consulting team 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/or artwork.
- 3.4.1.4. Typically, the consultant, EAC, Project Manager, and City of Edmonton Project Architect will work together to develop site location alternatives for public art pieces (typically three locations). The consultant shall produce a narrative and drawings showing these locations for the purpose of the consultative meetings with EAC
- 3.4.1.5. The Consultant shall provide general information on the project, including project description and suggested art locations, to the EAC for the Call to Artists. This information may 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 participate in either one or two juries to select the artist and/or final artwork. A typical jury session is a half day commitment.
- 3.4.1.6. Once the artist and/or 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 providing power in a specific location or considering structural elements related to the public art (eg. foundations) , or coordinating the art installation with the overall project delivery schedule. 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

- 3.5.1.1. 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 - office design layout standard
 - .4 Fire Rescue Service - Fire Station Functional Program
 - .5 Financial and Corporate Services - Cash Handling and Vault Security Design Guide
 - .6 Community Recreation Services - Wayfinding Standards

- 3.5.1.2. 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

- 3.6.1.1. [Designation and Rehabilitation of Municipal Historic Resources in Edmonton, Policy Number C450B, City of Edmonton, October 2008.](#)
- 3.6.1.2. [Standards and Guidelines for the Conservation of Historic Places in Canada, Second Edition, 2010.](#)

3.6.2. General

- 3.6.2.1. This policy provides guidelines for the identification, management, protection and promotion of historic resources.
- 3.6.2.2. 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 legal requirements of the respective heritage designations are being adhered to.

3.6.3. Definitions

- 3.6.3.1. **Historic Building Record:** detailed documentation of the building in its current state in order to create archival-level, complete, present-day drawing, photographic, and/or 3D rendering documentation. Historic Building Records typically guide future conservation work and reuse decision-making. The specific level of building recording will be defined in advance, on a project by project basis. Typical documentation entails the preparation of building elevations, floor plans, cross-sections and photographic documentation. Depending on the specific building and nature of the rehabilitation scope of work, additional documentation, such as 3D rendering or other methods may be required.
- 3.6.3.2. **Historic Building Condition Assessment:** An assessment of the current physical condition of a building, specifically related to the historic nature of the structure and its character-defining elements. The assessment will identify required conservation, life expectancy, and prioritization of rehabilitation of the building components and character-defining elements, including structural, mechanical, and electrical. These assessments are typically prepared in conjunction with a standard Building Condition Assessment.
- 3.6.3.3. **Conservation Plan:** Using the documentation from the Historic Building Record and Historic Building Condition Assessment as a guide, a Conservation Plan outlines the required rehabilitation work to the historic resource based on appropriate standards and guidelines, such as those from the *Standards and Guidelines for the Conservation of Historic Places in Canada*, to the significant character-defining elements of the structure. It further outlines circumstances where new materials may be introduced to assist in the proper conservation of the structure, in accordance with the Standards and Guidelines

3.7. Building Life Expectancy

3.7.1. References

- 3.7.1.1. Refer to the latest adopted [Infrastructure Asset Management Policy C598](#) which can be found on the City of Edmonton Website.

3.7.2. General

- 3.7.2.1. Consider the life expectancy and operational needs(ability to shutdown) of the building when designing the building envelope, making material choices, and designing building systems.
- 3.7.2.2. 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.
- 3.7.2.3. 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.

3.8. Crime Prevention through Environmental Design (CPTED)

3.8.1. References

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

3.8.2. General

- 3.8.2.1. 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.
- 3.8.2.2. 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.
- 3.8.2.3. 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.
- 3.8.2.4. 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

- 3.8.2.5. 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

- 3.9.1.1. 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.
- 3.9.1.2. 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

- 3.9.2.1. The bylaw is in place to protect the North Saskatchewan River Valley and Ravine System and establish principles for future development in those areas.
- 3.9.2.2. 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

- 3.10.1.1. City of Edmonton Enviso Website: www.edmonton.ca/enviso
- 3.10.1.2. 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

- 3.10.2.1. Enviso is the name of the City's environmental management system.
- 3.10.2.2. 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.
- 3.10.2.3. 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

- 3.10.3.1. 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.

- 3.10.3.2. 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.
- 3.10.3.3. 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

- 3.11.1.1. Erosion and Sedimentation Control Guidelines, City of Edmonton, Jan 2005. This document can be found on the City of Edmonton website.
- 3.11.1.2. 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

- 3.11.2.1. 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.
- 3.11.2.2. 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

- 3.12.1.1. 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.
- 3.12.1.2. 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

- 3.12.2.1. 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

- 3.13.1.1. 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.
- 3.13.1.2. 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 [City Design and Construction Standards](#)

3.14. *Visual Identity Standards*

3.14.1. References

- 3.14.1.1. 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.
- 3.14.1.2. 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.

3.15. *Tree Management Policy*

3.15.1. References

- 3.15.1.1. [Corporate Tree Management Policy - C456C](#)
- 3.15.1.2. [Corporate Tree Management and Tree Reserve Procedure - October 5, 2020](#)

- 3.15.1.3. Refer to the Edmonton Zoning Bylaw 12800 for Landscaping requirements, including incentives for preserving Existing Trees and Shrubs.

3.16. Gender Based Analysis + (GBA+)

3.16.1. References

- 3.16.1.1. City of Edmonton. (2018, April, 12) [Gender-Based Analysis +: What is it and Why \[video\] YouTube.](#)
- 3.16.1.2. City of Edmonton. (2019) [The Art of Inclusion: Our Diversity & inclusion Framework.](#)
- 3.16.1.3. [Social Vulnerability Map](#), Alberta Capital Region (2018, June)
- 3.16.1.4. Government of Canada. [Gender-based Analysis Plus course \[online course\]](#)
- 3.16.1.5. City of Edmonton. [The Process of Inclusion: GBA+](#)

3.16.2. General

- 3.16.2.1. The City's goal is to create an environment in which all individuals feel like they belong, and everyone has equal access to opportunities and resources. Inclusion is fundamental to the way we work. We are diverse and embrace difference with empathy and curiosity.
- 3.16.2.2. Gender-Based Analysis Plus (GBA+) is a tool to identify and address how people from diverse backgrounds experience policies, programs, and initiatives. The goal of GBA+ is to reduce or eliminate inequality and discrimination and ensure equality of outcomes for all Edmontonians.
- 3.16.2.3. Consultants are not expected to be experts on equity and diversity but can contribute to developing ways to improve outcomes for all community members through the use of GBA+. Consultants shall endeavour to research and address three fundamental GBA+ questions within their designs.
- Who is excluded or differentially impacted?
 - What contributes to this exclusion or impact?
 - What will we do about it?
- 3.16.2.4. Consultants shall endeavour to review their designs from multiple perspectives.
- Race, Colour, place of origin, ethnicity
 - immigration status
 - language
 - religious beliefs
 - gender, gender identity, and gender expression
 - appearance
 - physical and mental disability
 - political viewpoint
 - marital and family status
 - occupation, source of income, employment status
 - sexual orientation
 - age
 - poverty
 - homelessness

- 3.16.2.5. Consultants should request documentation of any previous GBA+ analysis of similar facility types to help inform their design. These are encouraged to be reminders so that consultants can keep the principles of GBA+ and inclusivity in general at the top of mind when doing their work.
- 3.16.2.6. Advanced GBA+: Where indicated in the Project's Professional Service Agreement, an advanced GBA+ analysis shall be performed by an agent with GBA+ training and experience with various intersectionalities. Advanced GBA+ analysis' shall use the City's GBA+ tool to form a basis for their work;
- reflect
 - research/engage
 - findings/recommendations
 - implementation/evaluation

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).

Sample drawing file name:

[CP-123456]_[BLD123]_A000.{dwg/pdf}

CP-123456

Project Number as supplied by Project Manager

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 “caf@edmonton.ca”.

A000

Drawing numbers 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

.dwg/pdf

AutoCAD or PDF file extension

APPENDIX C - CONSTRUCTION COST ESTIMATES

1. Construction Cost Estimates

- 1.1 The Consultant is required to provide the estimates stated below to the accuracies shown. All Construction Cost Estimates shall be presented in UNIFORMAT II elemental format and all quantities shall be reported and organized in accordance with the latest edition of ASTM International Standards E1557-09(2015) Standard Classification for Building Elements and related Site Work - UNIFORMAT II; E2516-11 Standard Classification for Cost Estimate Classification System and E2514-15 Standard Practice for Presentation Format of Elemental Cost Estimates, Summaries and Analysis. 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%)
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:

ASTM E 2516-11 TABLE X1.1 Illustrative Example of Typical Accuracy Ranges for General Building Construction Industries.

[Definitions](#)

APPENDIX D - SAMPLE CAD LAYERING STANDARD

1. General

- 1.1 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.
- 1.2 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.
- 1.3 Table D-1: CAD Layering Standard

X-YYYY-ZZZZ	
X	Major Group
	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

1.4 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

[Consultant Manual Acknowledgement Form](#)