

**THE CITY OF EDMONTON**  
**DESIGN-BUILD AGREEMENT**  
**CAPITAL LINE SOUTH LRT EXTENSION**

***Schedule 3***  
***Construction Schedule***

**TABLE OF CONTENTS**

1. DILIGENT PERFORMANCE OF PROJECT WORK ..... 1

2. CONSTRUCTION SCHEDULE ..... 1

3. CONSTRUCTION SCHEDULE REQUIREMENTS ..... 2

4. SCHEDULE UPDATES ..... 5

5. RECOVERY SCHEDULE ..... 5

6. CAPITAL LINE LRT INTEGRATION SCHEDULE ..... 6

7. CONFLICT BETWEEN AGREEMENT AND CONSTRUCTION SCHEDULE ..... 7

8. SITE REPORTS ..... 7

9. NON-PERFORMANCE EVENTS ..... 8

APPENDIX 3A KEY DATES ..... 9

APPENDIX 3B PERSON-HOURS S-CURVE EXAMPLE ..... 10

## SCHEDULE 3

### CONSTRUCTION SCHEDULE

#### 1. DILIGENT PERFORMANCE OF PROJECT WORK

Design-Builder shall:

- (a) commence the Project Work promptly following the Effective Date;
- (b) pursue the Project Work diligently so as to achieve each of the Key Dates listed in Appendix 3A [*Key Dates*] of this Schedule, at or before the time specified therefor, as such time may be modified from time to time in accordance with the terms of this Agreement;
- (c) perform the Project Work in material conformity with the Construction Schedule, as it may be amended from time to time in accordance with this Agreement; and
- (d) provide all documentation and information that the City requires in order to monitor, track and evaluate the progress and productivity of the Design and Construction compared to the Construction Schedule on a monthly basis.

#### 2. CONSTRUCTION SCHEDULE

2.1 Design-Builder shall prepare and submit to the City:

- (a) a preliminary construction schedule (the "**Preliminary Construction Schedule**") within 90 calendar days after the Effective Date, or at an alternate date accepted by the City in the Submittal Schedule and Register. This Preliminary Construction Schedule shall generally align to the Bid Construction Schedule attached at Schedule 23 [*Extracts from Bid*] to the City's satisfaction, and comply with Section 3 [*Construction Schedule Requirements*], except that it is to be detailed and resource loaded as per Sections 3.1(c) and 3.1(d) for all Design and Construction activities scheduled to occur in the first 365 calendar days after the Effective Date and must at least be detailed to Level 3 on the Work Breakdown Structure for all remaining work so long as all activities on any critical or near critical path are clearly identified; and
- (b) a comprehensive construction schedule (the "**Full Construction Schedule**") within 180 calendar days after the Effective Date, or at an alternate date accepted by the City in the Submittal Schedule and Register. The Full Construction Schedule shall align to and build on the Preliminary Construction Schedule that has been endorsed "Observations" or "Accepted" by the City pursuant to the Review Procedure and detail all remaining Design and Construction activities scheduled to occur after the initial 365 calendar days in full satisfaction of Section 3 of this Schedule. Design-Builder shall revise and resubmit to the City the Full Construction Schedule as required in order to achieve an 'Accepted' endorsement within 365 calendar days from the Effective Date.

2.2 For the purpose of this Agreement, a reference to the "**Construction Schedule**" shall mean

- (a) the Bid Construction Schedule attached at Schedule 23 [*Extracts from Bid*] until the Preliminary Construction Schedule has been endorsed "Observations", "Accepted" or deemed accepted by the City (at which point that Preliminary Construction Schedule becomes the Construction Schedule); and

- (b) the most recent Preliminary Construction Schedule determined in Section 2.2(a) until the Full Construction Schedule has been endorsed “Observations”, “Accepted” or deemed accepted by the City (at which point that Full Construction Schedule becomes the Construction Schedule).

The Construction Schedule shall be the reference point to which all Design and Construction progress, status, changes, variations, delays, accelerations and recoveries will be reported and measured against.

### **3. CONSTRUCTION SCHEDULE REQUIREMENTS**

#### **3.1 The Construction Schedule shall:**

- (a) at a minimum be in accordance with Good Industry Practice and consistent with:
  - (i) the Project Management Body of Knowledge (PMBOK Guide) – then current edition from the Project Management Institute;
  - (ii) the Practice Standard for Scheduling – then current edition from the Project Management Institute; and
  - (iii) the Association for the Advancement of Cost Engineering (AACE) International Recommended Practices – then current edition;
- (b) be structured following the Work Breakdown Structure where all activities roll-up to the Work Breakdown Structure at Level 3 as defined in Appendix 4A [*Work Breakdown Structure*] to Schedule 4 [*Design and Construction Protocols*];
- (c) be detailed to the finest level of granularity needed to satisfy the following requirements and uses to the City’s satisfaction:
  - (i) Must be to the level of detail necessary to provide the City complete and comprehensive insight into how the Design-Builder will manage, control, resource and execute on a week to week basis all activities to be carried out by the Design-Builder to complete the Project Work in its entirety including all mobilization, management, design, investigation, construction, testing, commissioning, demobilization and related activities;
  - (ii) Must be to the level of detail required to demonstrate how the Design-Builder will satisfy all Project Requirements through complete identification of all work activities, their durations, their resources and how they relate, depend, interact and impact each other over the course of the Project;
  - (iii) Must at least be to a Level 4 schedule according to AACE standards unless required to be more detailed in Section 3.1(c)(i) or (ii);
- (d) be completely resource loaded and resource leveled with:
  - (i) planned Person-Hours to be applied by the Design-Builder and Design-Builder Persons for each activity comprising the complete schedule;
  - (ii) planned equipment and equipment hours associated with each of the activities comprising the schedule;

- (e) include all actual progress and actual resource information realized on site for each activity to allow for a complete and comprehensive view to the City on how actual applied/expended resources are tracking compared to plans in the schedule, including:
  - (i) all actual Person-Hours expended on each activity;
  - (ii) all actual equipment utilization hours expended on each activity; and
  - (iii) be progressed to a data date of no more than 15 calendar days from the respective submission date to the City (Construction Schedule or Schedule Update as applicable);
- (f) be prepared using Primavera P6 scheduling software release 20.12 or later as directed by the City and using:
  - (i) the critical path method;
  - (ii) the following scheduling settings:
    - (A) the schedule option for defining progressed activities must be set to “retained logic”;
    - (B) the schedule option for defining critical activities must be set to “longest path”;
    - (C) activity codes must be set to project level, not global or enterprise project structure; and
    - (D) calendars must be set at project level, not global or resource level;
- (g) include unique activity identifiers for all scheduled activities that links to the Work Breakdown Structure Level 3;
- (h) include and differentiate through activity code any City activity that has an expressly stated timeline under this Agreement;
- (i) include all Key Dates, and other events for which a specified timeframe, deadline, or milestone is identified in this Agreement, whether or not described as a “milestone” or Key Date, including for certainty the Integrated Testing and Commissioning Readiness Date;
- (j) identify and account for all temporal restrictions on construction identified in this Agreement, including those identified in Schedule 10 [*Environmental Performance Requirements*];
- (k) comply with, and account for the Public Art scheduling requirements in Schedule 5 [*D&C Performance Requirements*] Part 2 [*Sustainable Urban Integration and Landscape Architecture*], and include the full Preliminary Public Art Integration Schedule for each Public Art opportunity and, when required pursuant to Section E-9 of Schedule 5 [*D&C Performance Requirements*] Part 2 [*Sustainable Urban Integration and Landscape Architecture*], the Public Art Integration Schedule for each Public Art opportunity;
- (l) include all Utility Work, and coordination tasks with Public Utility Companies and Pipeline Companies, with each item including at least one realistic predecessor and one realistic successor task, and scheduling each Utility Work item to start as early as possible;

- (m) include all Other Works, City Works and other relevant activities once known, with each item including at least one realistic predecessor and one realistic successor task;
- (n) include the relevant dates with respect to the acquisition of any Additional Lands;
- (o) not extend a Key Date except to reflect any extension of such date(s) agreed or otherwise determined in accordance with this Agreement;
- (p) provide for the Project Work to be commenced and pursued diligently in accordance with Section 1 *[Diligent Performance of Project Work]* of this Schedule, such that Design-Builder shall achieve all Key Dates;
- (q) be accompanied and supported by adequate narrative explanations and visual tools such that the City is provided a complete and comprehensive understanding of the Construction Schedule and all its underlying assumptions and structures, including:
  - (i) a narrative document explaining the schedule basis, methodology, activity coding structure, key relations and dependencies for each activity, critical and near critical paths, key risks and opportunities, and any other important facets and assumptions within the schedule (the “**Schedule Basis**”);
  - (ii) an implementation plan that further details and clearly explains the strategy and work methodology for how the project work is going to be designed and constructed within all the constraints and interrelationships, and:
    - (A) estimated productivity for each activity to complete the work on-time;
    - (B) total estimated Person-Hours grouped by month and a curve (such as an S-curve) and corresponding data table showing cumulative percent complete by month for planned and actual Person-Hours for the Project;
  - (iii) a single page view of the schedule with the Project track alignment on the horizontal axis, time on the vertical axis and progress of all key work activities over time on this grid (a “**Location-Time Chart**”);
- (r) be submitted to the City in:
  - (i) its native file format which shall be the same file used by Design-Builder to plan and control the work on an on-going basis and for certainty shall include all scheduling information and data needed to satisfy the schedule requirements of this Schedule;
  - (ii) A portable document format (PDF) version of the schedule that:
    - (A) is legible when printed on 11x17 paper;
    - (B) contains the following columns, as a minimum:
      - (1) task ID;
      - (2) task name;
      - (3) task duration;
      - (4) task start date;

- (5) task finish date;
  - (6) task predecessors;
  - (7) task successors;
  - (8) total float; and
  - (9) horizontal bars showing the actual progress over time versus the baseline;
- (C) contains separate pages identifying the longest path, critical path and near critical paths with less than 30 calendar days total float along with the float associated with each.

#### 4. SCHEDULE UPDATES

- 4.1 Design-Builder shall provide to the City, for information only, updates on the Construction Schedule on a monthly basis starting from 30 calendar days from the Effective Date and by the 7<sup>th</sup> day of each month thereafter (each, a “**Schedule Update**”), together with a copy of the complete Construction Schedule in its native P6 format. Each Schedule Update shall comply with the requirements of Section 3 [*Construction Schedule Requirements*] as applicable to the then current Construction Schedule, or as otherwise directed by the City, with the exception of the Time Location Chart which is to be provided quarterly and Sections 3.1(q)(i) and 3.1(q)(ii)(A) above which do not need to be included in the Schedule Updates. Each Schedule Update shall provide details of the performance of all Design and Construction activities performed and to be performed throughout the Construction Period.
- 4.2 Each Schedule Update shall include a Construction Schedule gantt chart comparing actual progress and projections to planned progress on each activity on the Construction Schedule.
- 4.3 Each Schedule Update shall include a complete summary of Key Dates, a comparison of actual progress and projections to planned start and end date for each Work Package to date, and an overall Person-Hours S-curve graphically showing the monthly incremental and cumulative planned and actual Person-Hours to date based on the Construction Schedule. Each Schedule Update shall include an update to the Person-Hours S-curve of each Work Package consistent with the example provided in Appendix 3B [*Person-Hours S-curve Example*]. Design-Builder shall provide the supporting data used in the development of every Person-Hours S-curve.
- 4.4 No Schedule Update shall amend or replace any information contained in the Construction Schedule. For greater certainty, the City shall not be deemed to have Accepted any changes to the Construction Schedule logic, relationships, durations, calendars, Key Dates or any other information, timeline or deadline which are reflected in a Schedule Update even if the Schedule Update has been deemed Accepted or endorsed as Accepted by the City.
- 4.5 Each Schedule Update shall include a narrative which shall clearly identify and explain all issues affecting the performance or progress of the Project Work, and deviations (positive or negative) from the last Schedule Update and Construction Schedule.

#### 5. RECOVERY SCHEDULE

- 5.1 If, in the opinion of the City:
- (a) Design-Builder fails to take appropriate action to recover from delays that in the opinion of the City put Key Dates in the Construction Schedule at risk; or

- (b) Design-Builder's revised implementation strategy or forecast dates for future activities or staging has changed to the extent that it is no longer practical to compare a Schedule Update against the current Construction Schedule,

Design-Builder shall prepare and submit to the City within 60 calendar days of a written request by the City, or within an alternate time as otherwise agreed by the City in writing, a variation to the Construction Schedule (a "**Recovery Schedule**"), which details Design-Builder's proposed alternate methods of performing the Project Work in order to address and mitigate any actual or projected delay or increased risk of not achieving Key Dates.

5.2 The Recovery Schedule shall:

- (a) comply with the requirements of Section 3 [*Construction Schedule Requirements*] of this Schedule;
- (b) include a written recovery statement describing the variances and the actions, including acceleration measures, planned by Design-Builder to mitigate any variances within the shortest reasonable time;
- (c) include a summary of, and justification for, all proposed changes to Construction Schedule logic and activity durations that Design-Builder anticipates will be necessary to mitigate any delays. Such proposed changes shall only be included in a Recovery Schedule if the changes reflect a justifiable change in approach by Design-Builder to the performance of the Project Work; and
- (d) demonstrate how Design-Builder has coordinated with and minimized impacts on Other Contractors that may be affected by any variances and mitigation measures when developing and executing a Recovery Schedule.

5.3 Design-Builder shall revise and resubmit to the City the Recovery Schedule as required to achieve an "Accepted" endorsement within 60 calendar days of the first submission of that Recovery Schedule.

5.4 A Recovery Schedule that is endorsed "Observations" or "Accepted" or deemed accepted by the City amends the Construction Schedule as provided in that Recovery Schedule, but does not amend any Key Dates unless agreed to by the City in accordance with this Agreement.

## **6. CAPITAL LINE LRT INTEGRATION SCHEDULE**

6.1 The Construction Schedule shall include a section dedicated to summarizing all interface points and milestones that:

- (a) involve operations or impacts to operations of the Capital Line LRT or are required to successfully complete the interface between and the integration of the Capital Line LRT and the Capital Line LRT South Extension;
- (b) are required to successfully coordinate, without delay, between the work performed by the City or City resources and equipment (including ETS) and the work performed by Design-Builder during all phases including design, construction, and commissioning;
- (c) are required to successfully coordinate and integrate the design, construction, and commissioning of the Infrastructure with the City's LRV's;

(the "**Capital Line LRT Integration Schedule**").



6.2 Each interface point or milestone is to have at least one work activity in the Construction Schedule as a predecessor that correctly drives when each interface point or milestone will be met and at least one successor that is correctly driven by the completion of the interface point or milestone. The Schedule Basis shall detail how Design-Builder will manage each interface point or milestone so as to ensure timelines are adhered to with no impacts to Key Dates, to minimize the impact on operation of Capital Line LRT, and to align the Construction Schedule to the Testing and Commissioning Schedule.

## 7. CONFLICT BETWEEN AGREEMENT AND CONSTRUCTION SCHEDULE

7.1 In the event of any conflict between a timeframe or deadline specified in this Agreement (as modified from time to time in accordance with its terms) and the Construction Schedule, the timeframe or deadline specified in this Agreement (as modified from time to time in accordance with its terms) shall, unless otherwise expressly agreed by the City, in its discretion, prevail.

## 8. SITE REPORTS

8.1 Design-Builder shall, from the date of commencement of Construction, keep accurate daily records of all construction site activities and resource information, including weather conditions, personnel, equipment usage, downtime, and any other relevant information and all material daily circumstances encountered on every work site where Project Work activities occur for any Project Work performed by Design-Builder or Design-Builder Persons (the “**Site Reports**”).

- (a) The Site Reports shall identify the associated schedule activity ID(s) for any work, material, resource, or issue, that is performed, delivered, or impacted by Design-Builder or Design-Builder Person and, where appropriate, identify actual start and finish dates.
- (b) The Site Reports shall identify the associated schedule activity IDs and narrative for any supplied photos. Ensure sufficient photos are provided to show all parts of the Work being undertaken.
- (c) The Site Reports shall include details of planned work, including associated schedule activity ID(s), for the following workday.
- (d) Design-Builder shall submit to the City 60 days after Effective Date the proposed template and content headings for the Site Reports in compliance with the Project Requirements.
- (e) Each Site Report shall be in the accepted template and include all information reasonably requested by the City.
- (f) Design-Builder shall summarize all Site Report information into a Microsoft Excel spreadsheet that allows for efficient graphical representation and comparison between the monthly planned versus actual resources. Design-Builder shall submit this spreadsheet (in .xml format) to the City by the 7<sup>th</sup> day of each month.
- (g) Design-Builder shall provide complete copies of all Site Reports from the previous month by the 7<sup>th</sup> day of each month as generated internally and aligned to Microsoft Excel spreadsheet in Section 10.1 of this Schedule.
- (h) Design-Builder shall extend all requirements of this section to its Subcontractors or otherwise commit to other means of acquiring all the required data that is acceptable to the City.

- (i) Design-Builder shall provide and shall cause each Subcontractor to provide to the City all Site Reports in the possession of, or available to, Design-Builder or such Subcontractor, as the City may reasonably require from time to time for any purpose in connection with this Agreement, within 10 Business Days upon request by the City.

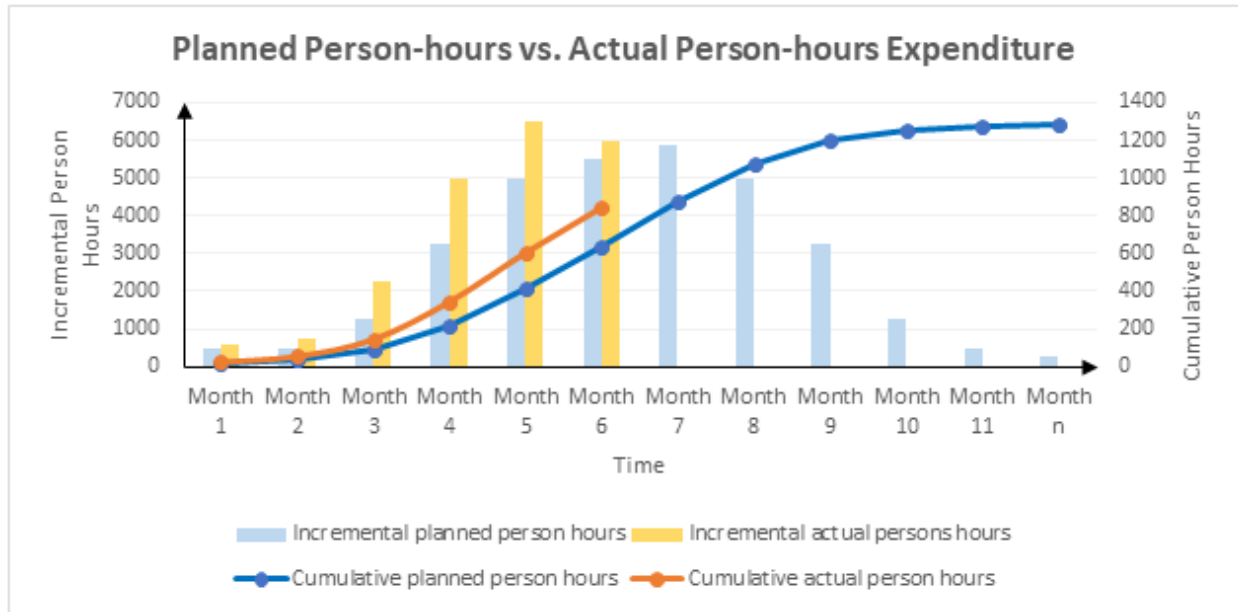
**9. NON-PERFORMANCE EVENTS**

- 9.1 Failure by Design-Builder to comply with the obligations set forth in this Schedule may constitute Non-Performance Events and may result in adjustments to the Payments, as more particularly provided in Schedule 16 [*Payment Mechanism*].

**APPENDIX 3A  
KEY DATES**

<b>Key Date</b>	<b>Date</b>
Target Construction Completion Date	June 30, 2028
Target PICO Completion Date	January 31, 2028
Long Stop Date	June 30, 2029

**APPENDIX 3B  
PERSON-HOURS S-CURVE EXAMPLE**



Time	Chart Area	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month n
Incremental planned person hours	100	100	250	650	1000	1100	1170	1000	650	250	100	50
Cumulative planned person hours	100	200	450	1100	2100	3200	4370	5370	6020	6270	6370	6420
Incremental actual persons hours	120	150	450	1000	1300	1200						
Cumulative actual person hours	120	270	720	1720	3020	4220						
Cumulative planned person-hours %	1.56%	3.12%	7.01%	17.13%	32.71%	49.84%	68.07%	83.64%	93.77%	97.66%	99.22%	100.00%
Cumulative actual person-hours %	1.87%	4.21%	11.21%	26.79%	47.04%	65.73%						