

PROJECT MANUAL

Sechelt Aquatic Centre – Lighting Upgrade

5500 Shorncliffe Avenue
Sechelt, BC

PRESENTED TO Sunshine Coast Regional District (SCRD)
1975 Field Road
Sechelt, BC V7Z 0A8

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SEALS PAGE

1.0 GENERAL

1.1 Professional Seals of Prime Consultant

.1 Prime Consultant

Seal & signature
Prime Consultant
McCuaig & Associates Engineering Ltd.

DOCUMENT VERIFICATION

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LIST OF DRAWING SHEETS

1.0 GENERAL

1.1 Not Used

.1 Not Used

DRAWING NO.	DESCRIPTION	[REVISION NO].
E-001	COVER SHEET	ISSUED FOR TENDER
E-101	FLOOR PLAN WEST	ISSUED FOR TENDER
E-102	FLOOR PLAN EAST	ISSUED FOR TENDER
E-201	LIGHTING AND PANEL SCHEDULE	ISSUED FOR TENDER
E-301	NATATORIUM ELEVATION AND ANCHORAGE DETAIL	ISSUED FOR TENDER
E-501	NATATORIUM ILLUMINANCE SIMULATION	ISSUED FOR TENDER

2.0 PRODUCTS

2.1 Not Used

.1 Not Used

3.0 EXECUTION

3.1 Not Used

.1 Not Used

END OF SECTION

SUMMARY OF WORK

1.0 GENERAL

1.1 Related Requirements

- .1 Drawings and general provisions of Contract, including all General and Supplementary Conditions and this Specification, apply to work of this section.

1.2 Project/work Identification

- .1 Contract Documents: Indicate the Work of the Contract and related requirements and conditions that have an impact on the project.

1.3 Summary by References

- .1 Work of the Contract can be summarized by references to the Contract, General Conditions, Supplementary Conditions, Specification Sections, Drawings, Addenda and modifications to the Contract Documents issued subsequent to the initial printing of this Project Manual and including (but not necessarily limited to) printed material referenced by any of these. It is recognized that work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomena, including weather conditions, and other forces outside the Contract Documents.

2.0 WRITTEN SUMMARY

The Work at the building can generally be summarized as follows:

2.1 General

- .1 The Work is to be conducted to the satisfaction of the Consultant.
- .2 The Contractor is responsible for obtaining any permits that are required for the Work.
- .3 All Work is to be completed and signed off by the Consultant at the end of the Work.
- .4 The Work areas are to be fenced off with approved safety barriers and signage to protect the staff, visitors, and pedestrians at all times.
- .5 Supply all labour, materials, equipment, supervision and sundry items to complete the Work as indicated.
- .6 The Work will start following a start-up meeting with Owner's Representative, The Contractor and the Consultant.
- .7 Maintain an orderly and clean work area on a daily basis. Remove all demolished material and construction debris from all building areas at the end of the day to a storage container provided by the Contractor. Assume on-site storage will not be available.
- .8 Provide protection for building finishes and equipment during performance of Work. Be responsible for damage incurred due to lack of or improper protection.
- .9 Any building services disruption shall be kept to a minimum. Provide two weeks written notice to building management to any activities that significantly disrupt building operation.

- .10 Provide one [1] year warranty and one [1] year service contract for all mechanical and electrical equipment.

2.2 Mobilization

- .1 The Contractor will provide and maintain:
 - .1 All site preparation to ensure all occupants, employees, visitors, and the public are protected during the course of the Work.
 - .2 All construction documentation as required by the Contract.
 - .3 All means of egress routes from the building shall be maintained during the Work.
 - .4 Provide the Consultant with a work schedule outlining the phasing of the Work, and where construction materials and debris will be stored.
 - .5 Coordinate with the Owners, Owner's Representatives and Consultant all movement of materials and equipment prior to proceeding.
 - .6 The Contractor is to provide all equipment and/or staging for the Work.

2.3 Preparation

- .1 Supply and install all protections to finished building surfaces not affected by the Work.
- .2 Provide self-contained disposal bins and storage bins to suit the Work. These bins require signage indicating "Not for Public Use". All costs for rental/delivery of disposal bins, disposal fees, storage bins, and off-site permits (if required) are to be included in the Work.
- .3 The Contractor, with the Consultant or other Owner's Representative present and prior to the Work starting, will complete a preconstruction review to identify any existing damage or concerns.
- .4 No Work shall commence until a building permit is issued by the Authority Having Jurisdiction.

2.4 The Work

The Work will include but is not limited to:

- .1 All tools, equipment, site supervision and site safety necessary to complete the work.
- .2 Partial Demolition
 - .1 Demolition of existing luminaires, chain-link anchorage support, wall switches and jumper cables. Removal, with separation of recyclable material.
- .3 Mechanical
 - .1 Provision of stainless steel aircraft cable for luminaire hanger, with all associated ties, anchors and clips.
 - .2 Provision of stainless steel aircraft cable seismic support.
- .4 Electrical Base Scope

- .1 Provide new luminaires according to the drawing lighting schedule.
- .2 Install new luminaires on mechanical support and attach seismic restraint.
- .3 Provide new lighting control as per the project drawings, shop drawings and specifications.
- .4 Connect new jumper cables to existing ceiling junction boxes and connect jumper cables to new luminaire.
- .5 Complete all new wiring connections as per the CEC.
- .5 Commissioning
 - .1 Perform commissioning tests in the presence of the Consultant as outlined in this document.
 - .2 Submit the completed reports before substantial completion of the project. Refer to Section 01 91 13 – General Commissioning Requirements.
 - .3 The Consultant holds the right to make the final acceptance decision of the commissioning report and related documentation.

2.5 Demobilization

- .1 Remove all construction debris from the site to an approved disposal facility. Contractor to recycle removed materials as much as possible.
- .2 Provide warranty and close-out documents as required by the Contract Documents. Display in a popular area.

2.6 Documents Required

- .1 Maintain at job site, one [1] copy of each document as follows:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed shop drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Change orders.
 - .7 Other Modifications to Contract.
 - .8 Field test reports.
 - .9 Copy of Approved Work Schedule.
 - .10 Health and Safety Plan and Other Safety Related Documents.
 - .11 Other documents as specified.

3.0 FIELD REVIEW OF WORK

- 3.1 The Contractor's work shall be observed at intervals by the Consultant or other representative of McCuaig & Associates Engineering Ltd. Confirmation of general conformance with these Specifications is to be obtained from the Consultant.

4.0 EXTRA WORK

- 4.1 No claim for extra work or material of any nature shall be considered without prior endorsement in writing by the Owner and the Consultant.

5.0 SATISFACTION OF OWNER AND CONSULTANT

- 5.1 The Work shall be done in accordance with the Contract Documents. The Owner and the Consultant shall be the judges of the Work in respect to both quality and quantity. Owner's and Consultant's decision will be final, except as allowed in the Contract.

6.0 CONTRACTOR USE OF PREMISES

- 6.1 The Contractor shall limit the use of the premises and minimize disturbance to occupant's and maintenance.
- .1 Use of the Site: Confine operations at the site to the areas permitted by the Owner. Portions of the building beyond areas on which work is indicated are not to be disturbed.
 - .2 Keep existing driveways and entrances clear and available to the Owners and their representatives at all times. Do not use these areas for parking or storage of materials without written permission from the Owner.
 - .3 Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain and pay for such storage off-site.
 - .4 Keep public areas free from accumulation of waste material, rubbish or construction debris. All Work areas must be kept clean. Conduct end-of-day clean-ups before leaving the Site.
 - .5 The use of toilets within the building, by the Contractor and their personnel will not be permitted by the Owner unless agreed upon otherwise.
 - .6 Provide protective hoarding, fencing, netting and barriers to ensure the safety of all persons in and around the area of work.

7.0 OWNER OCCUPANCY

- 7.1 Full Owner occupancy: The Owners will occupy the building during the entire period of construction. Coordinate any disturbances to building operations with the Owners.

8.0 CO-ORDINATION

- 8.1 General: The work of this Contract includes co-ordination of the entire Work of the project, including preparation of general co-ordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activity through project close-out and warranty periods.
- 8.2 If any unrelated Work is to be carried out during the project by the Owner or another company, the Contractor will provide adequate notice and co-ordination with the Owner and this company at no charge to allow this work to proceed smoothly.

END OF SECTION

WORK RESTRICTIONS

1.0 GENERAL

1.1 Related Requirements

- .1 Section 01 11 00 – Summary of Work
- .2 Section 01 32 16.19 – Construction Progress Schedule – Bar (GANNT) Chart
- .3 Section 01 35 29.06 – Health and Safety Requirements
- .4 Section 01 52 00 – Construction Facilities
- .5 Section 01 74 00 – Cleaning

1.2 Access and Egress

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.3 Use of Site and Facilities

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Owner's Representative and Consultant to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Contractor's use of sanitary facilities existing in building is allowed if permitted by Owner. Keep facilities clean.
- .5 Closures: protect work temporarily until permanent enclosures are completed.

1.4 Alterations, Additions or Repairs to Existing Building

- .1 Execute work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with Owner's Representative and Consultant to facilitate execution of work.

1.5 Existing Services

- .1 Notify, Owner's Representative, Consultant and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Owner's Representative and Consultant two [2] weeks of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

1.6 Special Requirements

- .1 Carry out all Work during regular hours. Notify Owner if after hours Work is necessary.

- .2 Submit schedule in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.
- .3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .4 Keep within limits of work and avenues of ingress and egress.

1.7 Security

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.
- .2 Security clearances:
 - .1 Contractor personnel should arrive on site already have required security clearance. Anyone without security clearance will not be permitted to be on site.
 - .2 Personnel employed on this project will be subject to security check. Obtain clearance, as instructed, for each individual who will require to enter premises.
 - .3 Obtain requisite clearance, as instructed, for each individual required to enter premises.

1.8 Building Smoking Environment

- .1 Comply with smoking restrictions. Smoking of any kind inside a building is not permitted.

2.0 PRODUCTS

2.1 Not Used

- .1 Not Used.

3.0 EXECUTION

3.1 Not Used

- .1 Not Used.

END OF SECTION

PROJECT MEETINGS

1.0 GENERAL

1.1 Related Requirements

- .1 Section 01 32 16.19 – Construction Progress Schedule – Bar (GANTT) Chart
- .2 Section 01 33 00 – Submittal Procedures
- .3 Section 01 52 00 – Construction Facilities
- .4 Section 01 78 00 – Closeout Submittals

1.2 Administrative

- .1 Consultant to schedule and administer project meetings with Contractor and Owner throughout the progress of the Work.
- .2 Prepare agenda for meetings to discuss with Consultant and Owner.
- .3 Notice of each meeting will be given four [4] business days in advance of meeting date to Contractor.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Consultant to record the meeting minutes. Includes significant proceedings and decisions. Identifies actions by parties.
- .7 Consultant to distribute copies of minutes within three [3] days after meetings and transmit to meeting participants.
- .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.3 Preconstruction Meeting

- .1 Within seven [7] days after execution of Contract, the Consultant will request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Consultant, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum five [5] days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.

- .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
- .5 Hazardous material identification and abatement necessary to perform Work.
- .6 Construction Waste Management Requirements in accordance with Section 01 74 19 - Waste Management and Disposal.
- .7 Site security in accordance with Section 01 52 00 - Construction Facilities.
- .8 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
- .9 Owner provided products.
- .10 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .11 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
- .12 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
- .13 Monthly progress claims, administrative procedures, photographs, hold backs.
- .14 Appointment of inspection and testing agencies or firms.
- .15 Insurances, transcript of policies.

1.4 Progress Meetings

- .1 During the course of Work and two [2] weeks prior to project completion, schedule progress meetings bi-weekly.
- .2 Report with progress photo should be provided weekly.
- .3 Contractor, major Subcontractors involved in Work and Consultant and Owner are to be in attendance.
- .4 Notify parties minimum five [5] days prior to meetings.
- .5 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within two [2] days after meeting.
- .6 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.

- .5 Review of off-site fabrication delivery schedules.
- .6 Corrective measures and procedures to regain projected schedule.
- .7 Revision to construction schedule.
- .8 Progress schedule, during succeeding work period.
- .9 Review submittal schedules: expedite as required.
- .10 Maintenance of quality standards.
- .11 Review proposed changes for affect on construction schedule and on completion date.
- .12 Other business.

2.0 PRODUCTS

2.1 Not Used

- .1 Not Used.

3.0 EXECUTION

3.1 Not Used

- .1 Not Used.

END OF SECTION

CONSTRUCTION PROGRESS SCHEDULE – BAR (GANTT) CHART

1.0 GENERAL

1.1 Related Requirements

- .1 All Sections

1.2 Definitions

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five-day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: overall system operated by Owner's Representative and Consultant to enable monitoring of project work in relation to established milestones.

1.3 Requirements

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4 Action and Informational Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Owner's Representative and Consultant within five [5] working days of Execution of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

- .3 Submit Project Schedule to Owner's Representative and Consultant within five [5] working days of receipt of acceptance of Master Plan.

1.5 Project Milestones

- .1 Project milestones form interim targets for Project Schedule.
 - .1 Mobilization completed within two [2] weeks from Notice to Proceed.
 - .2 Interior finishing and fitting, mechanical, and electrical work.
 - .3 Substantial Completion.

1.6 Master Plan

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Owner's Representative and Consultant will review and return revised schedules within five [5] working days.
- .3 Revise impractical schedule and resubmit within five [5] working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.7 Project Schedule

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Shop Drawings and/or Samples.
 - .3 Permits.
 - .4 Mobilization.
 - .5 Electrical Works.
 - .6 Testing and Commissioning.
 - .7 Supplied equipment long delivery items.
 - .8 Engineer supplied equipment required dates.

1.8 Project Schedule Reporting

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.9 Project Meetings

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

END OF SECTION

SUBMITTAL PROCEDURES

1.0 GENERAL

1.1 Related Requirements

- .1 All Sections

1.2 Administrative

- .1 Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
- .10 Keep one [1] reviewed copy of each submission on site.

1.3 Shop Drawings and Product Data

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .3 Allow five [5] days for Consultant's review of each submission.
- .4 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

- .5 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.
- .6 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .7 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .4 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .8 Submit one [1] electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.
- .9 Submit two [2] printed copies and one electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
- .10 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through

same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

- .11 The review of shop drawings by the Consultant is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that the Consultant approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 Photographic Documentation

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints: two [2] locations.

.1 Viewpoints and their location to best show work progress/schedule.

.4 Frequency of photographic documentation: weekly or as directed by Consultant.

.1 Upon completion of: Demolition/Removal, Installation of new units and as directed by Consultant.

1.5 Certificates and Transcripts

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

END OF SECTION

HEALTH AND SAFETY REQUIREMENTS

1.0 GENERAL

1.1 Related Requirements

- .1 Summary of Work – Section 01 11 00
- .2 Submittal Procedures – Section 01 33 00
- .3 Construction Facilities – Section 01 52 00
- .4 Cleaning – Section 01 74 00
- .5 Close Out Submittals – Section 01 78 00

1.2 Reference Standards

- .1 Province of British Columbia
 - .1 Workers Compensation Act, RSBC 1996 - Updated 2020.
 - .2 Occupational Health and Safety Regulation.
- .2 Federal.
 - .1 Canada Labour Code (R.S.C., 1985, c. L-2)
- .3 In the event of a conflict between the referenced standards, the more stringent and safety-conscious requirement shall be applied.

1.3 Action And Informational Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific safety plan (SSSP): to be submitted a minimum two [2] weeks prior to commencement of work. Health and Safety Plan must include:
 - .1 Results of site-specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation.
 - .3 On-site Contingency and Emergency Response Plan to address standard operating procedures to be implemented during emergency situations.
- .3 Submit one [1] copy of Contractor's authorized representative's work site health and safety inspection reports to Owner Representative and Consultant weekly.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Owner's Representative will review Contractor's site-specific Safety Plan and provide comments to Contractor within ten [10] days after receipt of plan. Revise plan as appropriate and resubmit plan to Owner's Representative within five [5] days after receipt of comments from Owner's Representative.

- .7 Owner's Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Owner's Representative.
- .9 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 Filing Of Notice

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.5 Safety Assessment

- .1 Perform site specific safety hazard assessment related to project.

1.6 Meetings

- .1 Schedule and administer Health and Safety meeting with Owner's Representative and Consultant prior to commencement of Work.

1.7 Regulatory Requirements

- .1 Do Work in accordance with Regulatory Requirements.

1.8 General Requirements

- .1 Develop written site-specific Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Owner's Representative and/or Consultant may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 Responsibility

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Safety Plan.

1.10 Compliance Requirements

- .1 Comply with current Workers Compensation Act, B.C.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 Unforeseen Hazards

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Owner's Representative and Consultant verbally and in writing.
- .2 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Health and Safety co-ordinator or Safety Officer and follow procedures in accordance with Acts and Regulations of Province having jurisdiction and advise Owner's Representative and Consultant verbally and in writing.

1.12 Posting Of Documents

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Owner's Representative and Consultant.

1.13 Correction Of Non-Compliance

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Owner's Representative and Consultant.
- .2 Provide Owner's Representative and Consultant with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Owner's Representative and Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 Blasting

- .1 Blasting or other use of explosives is not permitted.

1.15 Powder Actuated Devices

- .1 Use powder actuated devices only after receipt of written permission from Consultant.

1.16 Work Stoppage

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

END OF SECTION

REGULATORY REQUIREMENTS

1.0 GENERAL

1.1 Summary

- .1 This Section references laws, bylaws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction (AHJ), and other legally enforceable requirements applicable to the Work and that are or become enforced during performance of the Work.

1.2 Definitions

- .1 Reference Standards: Means consensus standards, trade association standards, guides, and other publications expressly referenced in the Contract Documents.

1.3 Related Requirements

- .1 List other Sections that are referenced in this Section that contain specific information that the reader might expect to find in this Section, but is specified elsewhere. Typically, this list does not include Division 00 or Division 01 Sections.

1.4 Reference Standards and Reference Documents

- .1 If specified referenced standards do not indicate an edition or version, the latest edition or revision issued by the publisher at the time of bid closing shall apply, except as follows:
 - .1 If a particular edition or revision date of a specified standard is referenced in an applicable code or other regulatory requirement, the edition or version in the regulatory reference shall apply.
 - .2 The specified reference standards establish minimum requirements. If Contract Documents indicate requirements that conflict with a reference standard, the more stringent requirements shall apply.
 - .3 If multiple reference standards are specified and the standards establish different requirements, the most stringent requirement shall apply.
 - .4 In case of discrepancy or uncertainties, refer to Consultant for interpretation or clarification.

1.5 Codes

- .1 Building Code: Perform Work in accordance with the British Columbia Building Code 2024 (BCBC) including amendments up to the time of bid closing and other codes of provincial or local application.
- .2 If there is a conflict or discrepancy between codes, the most stringent requirements shall apply.
- .3 Specific design and performance requirements listed in Specifications and indicated on Drawings may exceed minimum requirements established by referenced Codes; these requirements will govern over the minimum requirements listed in the referenced Codes.

1.6 Fees

- .1 Regulatory Requirements: Except as otherwise specified, Contractor shall apply for, obtain, and pay fees associated with permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:
 - .1 Regulatory requirements and fees in force at the time of bid closing, and

- .2 A change in regulatory requirements or fees scheduled to become effective after the time of bid closing and of which public notice has been given before the time of bid closing.

2.0 PRODUCTS

2.1 Permit Requirements

.1 Occupancy Permits:

- .1 Contractor shall apply for, obtain, and pay for occupancy permits, including partial occupancy permits where required by AHJ.
- .2 Contractor shall correct deficiencies in accordance with Consultant's instructions. If a deficiency is not corrected, the Owner reserves the right to make correction and charge Contractor for costs incurred.
- .3 Contractor shall turn occupancy permits over to Owner.

3.0 EXECUTION

3.1 Not Used

END OF SECTION

QUALITY ASSURANCE

1.0 GENERAL

1.1 Reference Standards

- .1 ASTM International (ASTM):
 - .1 ASTM E329-[20] Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
 - .2 International Organization for Standardization (ISO):
 - .1 ISO 9001: [2015], Quality Management Systems – Requirements

1.2 Definitions

- .1 Mock-up: A full-size physical example that demonstrates materials, finishes, interrelationship of materials and assemblies, aesthetic effects, and execution. A mock-up may demonstrate coordination of multiple Subcontractors' work. A mock-up establishes a standard by which the Work will be judged. Mock-ups are not samples.
- .2 Quality Assurance: Procedures for preventing defects and deficiencies before and during execution of the Work.
- .3 Quality Audit: Systematic and independent examination to determine whether quality requirements have been fulfilled as planned. A quality audit will examine processes, products and services to determine if they have been implemented effectively to achieve their specified objective.

1.3 Section Includes

- .1 This Section describes administrative and procedural requirements for proactive Contractor activities to assure the quality of construction before and during execution of the Work.

1.4 Administrative Requirements

- .1 Contractor is responsible for self-performed testing and inspections and submittal of test reports to Consultant.
- .2 Contractor to provide a Quality Management System that establishes a standardized approach to managing quality of materials and workmanship during the execution of Work in accordance with ISO 9001. Quality Management System will describe Contractor's contributions for testing and inspection programs as necessary for a successful Work.

1.5 Action and Informational Submittals

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit a detailed testing and inspections schedule to Consultant in accordance with the Contractor's Quality Management System.
- .3 Submit certificates for products, process and system for verification approval by Consultant.
- .4 Submit formal testing and inspections reports per ASTM E329 as indicated in technical specification Sections to Consultant and Owner in accordance with contractual agreement.

- .5 Submit one [1] digital copy and one [1] hardcopy of each quality assurance inspection and test report to Consultant, except where a technical specification Section indicates otherwise.
- .6 Submit mill test certificates as required in technical specification Sections and as indicated on Drawings.

1.6 Qualifications

.1 Manufacturers' Qualifications:

- .1 specializes in manufacturing the products specified in the technical Section of the Project's construction specification.
- .2 minimum three [3] years documented experience with a record of successful performance

.2 Suppliers' Qualifications:

- .1 authorized to distribute manufacturer's products
- .2 has capacity to supply required products without delaying the Project

.3 Fabricators' Qualifications:

- .1 experienced in producing products required for this Project
- .2 successful record of in-service performance
- .3 sufficient production capacity to fabricate required products without delaying the Project

.4 Installer Qualifications:

- .1 firm or individual experienced in design and installation, application, and erection of materials to the extent required for this Project
- .2 successful record of in-service performance

.5 Testing and Inspecting Agency Qualifications:

- .1 accredited organizations by the Standards Council of Canada for testing and inspection
- .2 capable of reliably performing testing of building products and inspections of construction activities in accordance with ISO 9001 and ASTM E329.

.6 Licensed Professionals Qualifications:

- .1 individual registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the province or jurisdiction in which the project is to be constructed.

1.7 Certifications

- .1 Ensure that certification of products, processes, and systems includes physical and examination testing as specified in ASTM E329 ISO 9001 to confirm compliance with Specifications requirements.

1.8 Coordination

- .1 Coordinate and schedule tests and inspections with accredited testing inspection agencies as indicated in Contract Documents and in accordance with ASTM E329 requirements.
- .2 Coordinate Contractor's Quality Management System with Consultant for reporting, scheduling access and incidental labour required by Quality Auditor's reports if required.
- .3 Obtain Consultant approval before proceeding with tests and inspections , and additional tests and inspections as may be reasonably requested by Consultant and Owner.
- .4 Coordinate testing and inspections schedule with Subcontractor, testing agencies, and other affected parties.

1.9 Site Samples

- .1 Obtain Consultant's acceptance to proceed with the sampling process.
 - .1 Testing agency is responsible for obtaining representative samples of those materials required to be tested and evaluated as directed by Consultant and Owner in accordance with the Contractual Documents.
- .2 Ensure testing agency performs sampling in accordance with ASTM E329.
 - .1 When sampling collection is required by testing agency, ensure proper protection, handling and storing of samples.
- .3 Testing agency to document procedures and appropriate techniques to select samples.
- .4 Record details of environmental conditions present during the sampling, such as rain or freezing weather that may affect testing of sample or interpretation of test results.

1.10 Mock-Ups

- .1 Mock-ups can be used as a reference for assessing quality of workmanship and site-applied finishes as requested in the project's Contract Documents.
- .2 Obtain Consultant's acceptance of mock-ups installation before beginning to install those portions of the Work represented by the mock-up.
- .3 Assemble mock-ups at the Place of the Work in locations acceptable to Consultant , or where location is indicated in the technical specification Section.
- .4 Schedule mock-ups ready for Consultant 's review and in orderly sequence, to avoid delays in Work.
 - .1 Failure to prepare mock-ups in ample time is not considered sufficient reason to request an extension of Contract Time. Claims for extension of Contract Time by reason of such default will not be considered.
- .5 If requested, Consultant will assist in scheduling dates for construction of mock-ups.
- .6 Construct mock-ups using materials, finishes, colours, and methods proposed for the completed Work. Mock-ups to demonstrate proposed workmanship and range of aesthetic appearance.
- .7 Where a mock-up represents or affects multiple specification Sections, coordinate activities of these Subcontractors to ensure mock-ups are complete.

- .8 Modify or replace mock-ups when unacceptable to Consultant.
- .9 Maintain acceptable mock-ups in an undisturbed condition as a standard for judging the completed Work.

2.0 PRODUCTS

2.1 Not Used

3.0 EXECUTION

3.1 Not Used

END OF SECTION

CONSTRUCTION FACILITIES

1.0 GENERAL

1.1 Related Requirements

- .1 Section 01 11 00 – Summary of Work
- .2 Section 01 14 00 – Work Restrictions
- .3 Section 01 33 00 - Submittals Procedures
- .4 Section 01 35 29.06 – Health and Safety Requirements
- .5 Section 01 74 11 – Cleaning
- .6 Section 01 78 00 – Close Out Submittals

1.2 Reference Standards

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2020, Stipulated Price Contract.

1.3 Action and Informational Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 Site Storage/Loading

- .1 Refer to CCDC 2, GC 3.12.
- .2 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .3 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.5 Security

- .1 Follow security procedures of the building. Contractor responsible for keys or access cards (or similar devices) that are retained for purposes of completing the Work.

1.6 Offices

- .1 Not Applicable for this project.

1.7 Equipment, Tool and Materials Storage

- .1 The Owner may designate acceptable areas for storage of tools, equipment and materials on site. Tools, equipment and materials shall not be left in general public areas or be accessible to the public at any time.
- .2 Storage space provided by the Owner shall be limited to a dedicated on-site storage room.
- .3 The Owner will not be held responsible for the loss of the Contractor's tools, equipment and materials.

1.8 Sanitary Facilities

- .1 Washroom accessibility will be reviewed with Building Managers. A set of keys will be provided to the Contractor prior to the Work and shall be returned at the end of the project.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval of Owner's Representative.

1.9 Equipment, Tool and Materials Storage

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.10 Construction Signage

- .1 Provide and erect project sign, within the same time as mobilization, in a location designated by Owner's Representative.
- .2 Indicate on sign, name of Owner, Consultant and Contractor and Subcontractor, of design style established by Consultant.
- .3 No other signs or advertisements, other than warning signs, are permitted on site.
- .4 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.
- .5 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Owner's Representative.

1.11 Clean-Up

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.

END OF SECTION

CLEANING

1.0 GENERAL

1.1 Related Requirements

- .1 This section of the specification forms part of the contract documents and is to be read, interpreted and coordinated with all other parts.

1.2 Reference Standards

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2020, Stipulated Price Contract.

1.3 Project Cleanliness

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2 Waste manifests are a regulated requirement for any applicable hazardous materials. Construction, renovation, demolition, demolition waste is all tracked separately.
- .3 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Owner's Representative and Consultant. Do not burn waste materials on site.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Dispose of waste materials and debris at designated dumping areas off-site.
- .7 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.4 Final Cleaning

- .1 Refer to CCDC 2, GC 3.14.
- .2 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

- .3 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .4 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .5 Remove waste products and debris other than that caused by Owner or other Contractors.
- .6 Remove waste materials from site at regularly scheduled times or dispose of as directed by Owner's Representative and Consultant. Do not burn waste materials on site.
- .7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .8 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .9 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
- .10 Clean lighting reflectors, lenses, and other lighting surfaces.
- .11 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .12 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .13 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .14 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .15 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

2.0 PRODUCTS

2.1 Not Used

- .1 Not Used.

3.0 EXECUTION

3.1 Not Used

- .1 Not Used.

END OF SECTION

CLOSEOUT PROCEDURES

1.0 GENERAL

1.1 Reference Standards

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2020, Stipulated Price Contract.
- .2 Canadian Environmental Protection Act (CEPA)
 - .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

1.2 Administrative Requirements

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor is required to conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Consultant in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Consultant's inspection.
 - .2 Consultant's Inspection:
 - .1 Consultant and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
- .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested, adjusted and balanced and fully operational.
 - .4 Operation of systems: demonstrated to Owner's personnel.
 - .5 Work: complete and ready for final inspection.
- .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Consultant, and Contractor.
 - .2 When Work is incomplete according to Owner and Consultant, complete outstanding items and request re-inspection.
- .5 Declaration of Substantial Performance: when Consultant considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

- .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .7 Final Payment:
 - .1 When Consultant considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
 - .2 Refer to CCDC 2: when Work deemed incomplete by Consultant, complete outstanding items and request re-inspection.
- .8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.3 Final Cleaning

- .1 Clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

2.0 PRODUCTS

2.1 Not Used

- .1 Not Used.

3.0 EXECUTION

3.1 Not Used

- .1 Not Used.

END OF SECTION

CLOSEOUT SUBMITTALS

1.0 GENERAL

1.1 Administrative Requirements

.1 Pre-warranty Meeting:

- .1 Convene meeting one [1] week prior to contract completion with Contractor, Owner's Representative and Consultant, to:
 - .1 Verify Project requirements.
 - .2 Review manufacturer's installation instructions and warranty requirements.
- .2 Consultant to establish communication procedures for:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
- .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
- .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.2 Prerequisites to Substantial Performance

- .1 General: Complete Work in accordance with the Builders Lien Act of British Columbia before requesting the Consultant's review for Certification of Substantial Performance. List known exceptions in the request.
- .2 In the progress payment request that coincides with, or is the first request following, the date Substantial Performance is claimed, show either 100 percent completion for the portion of the Work claimed as "Substantially Performed", or list incomplete items, the value of incomplete Work, and reasons for the Work being incomplete.
 - .1 Include Workers' Compensation Board Certificate of good standing.
 - .2 Submit Statutory Declaration of Progress Payment
 - .3 Submit a statement showing an accounting of changes to the Contract Price.
 - .4 Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents.
 - .5 Obtain and submit releases enabling Owner's full, unrestricted use of the Work and access to services and utilities. Where required, include occupancy permits, operating certificates and similar releases.
 - .6 Draft out full O&M manual including completed CMMS forms to be available for Consultant review at time of substantial completion walk through.

- .7 Deliver tools, spare parts, extra stocks of material and similar physical items to the Owner.
- .8 Discontinue or change over and remove temporary facilities and services from the project site, along with construction tools, facilities, and similar elements.
- .9 Complete final cleaning up requirements, including touch-up painting of marred surfaces and cleaning of floors, stairs and roofs.
- .10 Touch-up and otherwise repair and restore marred exposed finishes.

1.3 Prerequisites to Final Acceptance

- .1 General: Complete the following before requesting the Consultant's final review for certification of final acceptance, and final payment as required by the General Conditions. List known exceptions, if any, in request:
 - .1 Submit the final payment request with final releases and supporting documentation not previously submitted and accepted.
 - .2 Submit an updated final statement, accounting for final additional changes to the Contract Price.
 - .3 Submit a certified copy of the Consultant's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and has been endorsed and dated by the Consultant.
- .2 Review Procedure: The Consultant will review the Work upon receipt of the Contractor's notice that the Work, including punch-list items resulting from earlier reviews, has been completed, except for these items whose completion has been delayed because of circumstances that are acceptable to the Consultant.
 - .1 Upon completion of review, the Consultant will either prepare a certificate of final acceptance, or will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled, but are required for final acceptance.
 - .2 If necessary, the review procedure will be repeated.

1.4 Action and Informational Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two [2] weeks prior to Substantial Performance of the Work, submit to the Owner's Representative and Consultant, two [2] final hard copies and one [1] digital copy of operating and maintenance manuals in English until the review is completed and accepted. Hard copies are not required until the draft review is completed and accepted.
- .3 Provide evidence, if requested, for type, source and quality of products supplied.

1.5 Format

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, one-inch or greater 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets. Sections are as follows:
- .3 When multiple binders are used correlate data into related consistent groupings.

- .1 Identify contents of each binder on spine.
 - .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
 - .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
 - .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
 - .7 Text: manufacturer's printed data, or typewritten data.
 - .8 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.
 - .9 Provide 1:1 scaled CAD files in dwg format on CD or memory stick. Provided by the Consultant.
- 1.6 Contents - Project Record Documents
- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
 - .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
 - .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

Items:
Binder Cover and Binder Edge and Title Page: Project Name, Building Name, address, project number, Project Completion Date, Volume and Elements of Project Contained in Manual
Table of Contents: Project Name, Building Name, address, project number, Project Completion Date and table of contents.
Tab A - Contact Information: Include contact information for Consultant, General Contractor and all Subcontractors. Complete list of names, addresses, telephone numbers of Contractor, Subcontractor, Suppliers, and 24-hour emergency service numbers for each supplier in this section.
Tab B - Signed Letter of Warranty:

Signed and dated warranty letters to include project name, project number, location, warranty start date (to be the date of Substantial Completion as declared by Consultant), and all manufacturer and extended warranties.
Tab C - Shop Drawings: A copy of all Shop Drawings reviewed by the Consultant including associated project specifications. Include shop drawing log
Tab D - All Reports: System Operation: Expand on the way in which each of the systems operates. 1. Start-Up, interfaces/interlocks 2. Setpoints 3. Running 4. Sequences of Operation: a. Provide Designers operating requirements 5. Shut down, interfaces/interlocks 7. Permits or certifications from Authorities having jurisdictions
Tab E – Manufacturers Literature/Information: Include all the manufacturer's information (IOM) relating to the equipment, ancillaries, and systems.
Tab F –As Built Drawings: Mark up drawings by the Contractor to the Consultant.
Tab H – Consultant Site Inspection Reports: Inspection report(s) conducted during the implementation of the project
Tab I – Training Records: A copy of all training schedules, attendance records. Indicate if training sessions were recorded.
Tab K – Disposal of Equipment: Submit copies of transportation documents or shipping manifests indicating weights of materials, and other evidence of disposal indicating final location of waste diverted from landfill and waste sent to landfill.
Tab L – Handover Spare Parts: Provide inventory spare parts and maintenance materials in quantities specified in individual spec sections and special tools of same quality and manufacture as products provided in Work. Provide a list of spares that are recommended to be held by the operator/facilities department.
Tab M – Final Commissioning Report – Consultant Final Commissioning report to consist of an executive summary and include all commissioning documentation completed and/or reviewed by the commissioning agent.

1.7 As -Built Documents and Samples

- .1 Maintain, in addition to requirements in General Conditions, at site for Owner Representative one [1] hard copy and one [1] electronic copy of:
 - .1 Contract Drawings.
 - .2 Specifications.

- .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
 - .2 Store record documents and samples in field office apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
 - .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
 - .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
 - .5 Keep record documents and samples available for inspection by Consultant.
- 1.8 Recording Information on Project Record Documents
- .1 Record information on set of opaque drawings, and in copy of Project Manual, provided by Consultant.
 - .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
 - .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
 - .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 Referenced Standards to related shop drawings and modifications.

- .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

1.9 Equipment and Systems

- .1 For each item of equipment and each system include description of unit or system, and component parts.
 - .1 Give function, normal operation characteristics and limiting conditions.
 - .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
 - .1 Include regulation, control, stopping, shut-down, and emergency instructions.
 - .2 Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.
- .12 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .13 Include test and balancing reports as specified in Section 01 45 00 - Quality Control and 01 91 13 - General Commissioning Requirements.

.14 Additional requirements: as specified in individual specification sections.

1.10 Materials and Finishes

- .1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional requirements: as specified in individual specifications sections.

1.11 Maintenance Materials

.1 Spare Parts:

- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to location as directed; place and store.
- .4 Receive and catalogue items.
 - .1 Submit inventory listing to Owner's Representative and Consultant.
 - .2 Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

.2 Extra Stock Materials:

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to location as directed; place and store.
- .4 Receive and catalogue items.
 - .1 Submit inventory listing to Owner's Representative and Consultant.
 - .2 Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

.3 Special Tools:

- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.

- .3 Deliver to location as directed; place and store.
- .4 Receive and catalogue items.
 - .1 Submit inventory listing to Owner's Representative and Consultant.
 - .2 Include approved listings in Maintenance Manual.

1.12 Delivery, Storage and Handling

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and for review by Consultant.

1.13 Warranties and Bonds

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Owner's Representative and Consultant approval.
- .3 Warranty management plan to include required actions and documents to assure that Owner Representative] receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to Owner's Representative and Consultant for approval prior to each monthly pay estimate.
- .6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.

- .7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct a 11-month warranty inspection, measured from time of acceptance, by Owner's Representative and Consultant.
- .9 Include information contained in warranty management plan as follows:
 - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
 - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include luminaires, and commissioned systems.
 - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
 - .1 Name of item.
 - .2 Model and serial numbers.
 - .3 Location where installed.
 - .4 Name and phone numbers of manufacturers or suppliers.
 - .5 Names, addresses and telephone numbers of sources of spare parts.
 - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
 - .7 Cross-reference to warranty certificates as applicable.
 - .8 Starting point and duration of warranty period.
 - .9 Summary of maintenance procedures required to continue warranty in force.
 - .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
 - .11 Organization, names and phone numbers of persons to call for warranty service.
 - .12 Typical response time and repair time expected for various warranted equipment.
 - .4 Contractor's plans for attendance at 11-month post-substantial completion warranty inspections.
 - .5 Procedure and status of tagging of equipment covered by extended warranties.
 - .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .10 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .11 Written verification to follow oral instructions.
 - .1 Failure to respond will be cause for the Owner's Representative and Consultant to proceed with action against Contractor.

1.14 Warranty Tags

- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Owner's Representative and Consultant.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.
- .3 Leave date of acceptance until project is accepted for occupancy.
- .4 Indicate following information on tag:
 - .1 Type of product/material.
 - .2 Model number.
 - .3 Serial number.
 - .4 Contract number.
 - .5 Warranty period.
 - .6 Inspector's signature.
 - .7 Construction Contractor.

2.0 PRODUCTS

2.1 Not Used

- .1 Not Used.

3.0 EXECUTION

3.1 Not Used

- .1 Not Used.

END OF SECTION

GENERAL COMMISSIONING REQUIREMENTS

1.0 GENERAL

1.1 Summary

- .1 Section includes the General commissioning requirements for the project.

1.2 Related Requirements

- .1 Section 01 11 00 - Summary of Work
- .2 Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart
- .3 Section 01 33 00 - Submittal Procedures
- .4 Section 01 91 13.16 - Commissioning Forms
- .5 Section 26 08 00 - Commissioning of Electrical

1.3 Abbreviations

- .1 BMM: Building Management Manual
- .2 Cx: Commissioning
- .3 CxAg: Contractor's Commissioning Agent
- .4 EMCS: Energy Monitoring and Control Systems
- .5 O&M: Operation and Maintenance
- .6 PI: Product Information
- .7 PV: Performance Verification
- .8 TAB: Testing, Adjusting and Balancing
- .9 WHMIS: Workplace Hazardous Materials Information System
- .10 SDS: WHMIS Safety Data Sheets

1.4 General

- .1 Commissioning: The process for achieving, verifying, and documenting that the facility and its systems are planned, designed, installed, and tested to ensure that they meet the original project requirements established by the Owner and Consultant.
 - .1 Verify installed equipment, systems and integrated systems operate in accordance with Contract Documents and design criteria and intent.
 - .2 Ensure appropriate documentation is presented.
 - .3 Effectively train Operations and Maintenance staff.

- .2 Contractor assists in the Commissioning process, operating equipment and systems, troubleshooting and making adjustments as required.
 - .1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently.
 - .2 During these checks, adjustments to be made to enhance performance to meet environmental or user requirements.
 - .3 Design Criteria: as per Owner's requirements or determined by Consultant. To meet Project functional and operational requirements.
 - .4 Commissioning activities supplement field quality and testing procedures described in relevant technical sections.
 - .5 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor. Above costs to be in form of progress payment reductions or hold-back assessments.
- 1.5 Conflicts
- .1 Report conflicts between requirements of this section and other sections to Consultant before start-up and obtain clarification.
 - .2 Failure to report conflict and obtain clarification will result in application of most stringent requirement.
- 1.6 Action and Informational Submittals
- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- 1.7 Commissioning Documentation
- .1 Refer to Section 01 91 13.16 - Commissioning Forms
 - .2 Owner's Representative and Consultant to review and approve Commissioning documentation.
 - .3 Provide completed and approved Commissioning documentation to Owner's Representative and Consultant
- 1.8 Commissioning Meetings
- .1 Convene Cx meetings following project meetings: Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart and as specified herein.
 - .2 Purpose: to resolve issues, monitor progress, identify deficiencies, relating to Cx.
 - .3 Continue Cx meetings on regular basis until commissioning deliverables have been addressed.
- 1.9 Starting and Testing
- .1 Contractor assumes liabilities and costs for inspections. Including disassembly and re-assembly after approval, starting, testing and adjusting, including supply of testing equipment.
- 1.10 Witnessing of Starting and Testing

- .1 Consultant is required to witness the commissioning.
- .2 Provide fourteen [14] days notice prior to commencement.
- .3 Contractor's Cx Agent to be present at tests performed and documented by sub-trades, suppliers and equipment manufacturers.

1.11 Procedures

- .1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, testing and Cx.
- .2 Conduct start-up and testing in following distinct phases:
 - .1 Start-up: follow accepted start-up procedures.
 - .2 Operational testing: document equipment performance.
 - .3 Post-substantial performance verification: to include fine-tuning.
- .4 Correct deficiencies and obtain approval from Consultant after distinct phases have been completed and before commencing next phase.

1.12 Operation and Maintenance of Equipment and Systems

- .1 After start-up maintain equipment and systems as directed by equipment/system manufacturer.
- .2 With assistance of manufacturer develop written maintenance program and submit Consultant for approval before implementation.
- .3 Operate and maintain systems for length of time required for commissioning to be completed.
- .4 After completion of commissioning, operate and maintain systems until issuance of certificate of interim acceptance.

1.13 Instruments/Equipment

- .1 Submit to Consultant for review and approval:
 - .1 Complete list of instruments proposed to be used.
 - .2 Listed data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.
- .2 Provide the following equipment as required:
 - .1 2-way radios.
 - .2 Ladders.
 - .3 Equipment as required to complete work.

1.14 Authorities Having Jurisdiction

- .1 Where specified start-up, testing or commissioning procedures duplicate verification requirements of authority having jurisdiction, arrange for authority to witness procedures so as to avoid duplication of tests and to facilitate expedient acceptance of facility.
- .2 Obtain certificates of approval, acceptance and compliance with rules and regulation of authority having jurisdiction.
- .3 Provide copies to Consultant within five [5] days of test and with Cx report.

1.15 Sundry Checks and Adjustments

- .1 Make adjustments and changes which become apparent as Cx proceeds.

1.16 Deficiencies, Faults, Defects

- .1 Correct deficiencies found during start-up and Cx to satisfaction of Consultant.
- .2 Report problems, faults or defects affecting Cx to Consultant in writing. Stop Cx until problems are rectified. Proceed with written approval from Consultant.

1.17 Completion of Commissioning

- .1 Upon completion of Cx leave systems in normal operating mode.
- .2 Cx to be considered complete when contract Cx deliverables have been submitted and accepted by Consultant.

1.18 Activities Upon Completion of Commissioning

- .1 When changes are made to baseline components or system settings established during Cx process, provide updated Cx form for affected item.

1.19 Maintenance Materials, Spare Parts, Special Tools

- .1 Supply, deliver, and document maintenance materials, spare parts, and special tools as specified in contract.

1.20 Occupancy

- .1 Cooperate fully with Consultant during stages of acceptance and occupancy of facility.

1.21 Owner's Performance Testing

- .1 Performance testing of equipment or system by Consultant will not relieve Contractor from compliance with specified start-up and testing procedures.

END OF SECTION

COMMISSIONING FORMS

1.0 GENERAL

1.1 Summary

.1 Section Includes:

.1 Commissioning forms to be completed for equipment, system and integrated system.

.2 Related Requirements

.1 Section 01 11 00 – Summary of Work

.2 Section 01 91 13. – General Commissioning Requirements

1.2 Installation/Start-Up Check Lists

.1 Include the following data:

.1 Product manufacturer's installation instructions and recommended checks.

.2 Special procedures as specified in relevant technical sections.

.3 Items considered good installation and engineering industry practices deemed appropriate for proper and efficient operation.

.2 Equipment manufacturer's installation/start-up check lists are acceptable for use. As deemed necessary by Owner's Representative supplemental additional data lists will be required for specific project conditions.

.3 Use check lists for equipment installation. Document check list verifying checks have been made, indicate deficiencies and corrective action taken.

.4 Installer to sign check lists upon completion, certifying stated checks and inspections have been performed. Return completed check lists to Consultant. Check lists will be required during Commissioning and will be included in Building Maintenance Manual (BMM) at completion of project.

.5 Use of check lists will not be considered part of commissioning process but will be stringently used for equipment pre-start and start-up procedures.

1.3 Product Information (PI) Report Forms

.1 Product Information (PI) forms compiles gathered data on items of equipment produced by equipment manufacturer, includes nameplate information, parts list, operating instructions, maintenance guidelines and pertinent technical data and recommended checks that is necessary to prepare for start-up and functional testing and used during operation and maintenance of equipment. This documentation is included in the BMM at completion of work.

.2 Prior to Performance Verification (PV) of systems complete items on PI forms related to systems and obtain Consultants' approval.

1.4 Performance Verification (PV) Forms

- .1 PV forms to be used for checks, running dynamic tests and adjustments carried out on equipment and systems to ensure correct operation, efficiently and function independently and interactively with other systems as intended with project requirements.
 - .2 PV report forms include those developed by Contractor records measured data and readings taken during functional testing and Performance Verification procedures.
 - .3 Prior to PV of integrated system, complete PV forms of related systems and obtain Consultants' approval.
 - .4 List of equipment that require PV checklist/forms to be completed by Contractor and submitted to Consultant:
 - .1 Electrical
 - .1 Luminaires
 - .2 Grounding
 - .3 Lighting Controls
 - .4 Energized junction box
 - .2 Mechanical
 - .1 Luminaire Support Cable
 - .2 Seismic Restraint
- 1.5 Samples of Commissioning Forms
- .1 Consultant will develop and provide to Contractor required project-specific Commissioning forms in electronic format complete with specification data.
 - .2 Revise items on Commissioning forms to suit project requirements.
 - .3 Samples of Commissioning forms and a complete index of produced to date will be attached to this section.
- 1.6 Changes and Development of New Report Forms
- .1 When additional forms are required, but are not available from Consultant develop appropriate verification forms and submit to Consultant for approval prior to use.
 - .1 Additional commissioning forms to be in same format as provided by Consultant.
- 1.7 Commissioning Forms
- .1 Use Commissioning forms to verify installation and record performance when starting equipment and systems.
 - .2 Strategy for Use:
 - .1 Consultant provides Contractor project-specific Commissioning forms with Specification data included.

- .2 Contractor will provide required shop drawings information and verify correct installation and operation of items indicated on these forms.
- .3 Confirm operation as per design criteria and intent.
- .4 Identify variances between design and operation and reasons for variances.
- .5 Verify operation in specified normal and emergency modes and under specified load conditions.
- .6 Record analytical and substantiating data.
- .7 Verify reported results.
- .8 Form to bear signatures of recording technician and reviewed and signed off by Consultant.
- .9 Submit immediately after tests are performed.
- .10 Reported results in true measured SI unit values.
- .11 Provide Consultant with originals of completed forms.
- .12 Maintain copy on site during start-up, testing and commissioning period.

1.8 Language

- .1 To suit the language profile of the awarded contract.

END OF SECTION

SELECTIVE DEMOLITION

1.0 GENERAL

1.1 Summary

- .1 Section Includes:
 - .1 Demolition and disposal of selected building items
 - .2 Removal and reinstallation of selected building items
 - .3 Repair and restoration work after completion of work of this Section

1.2 Related Requirements

- .1 Interior Repairs – Section 09 25 00

1.3 Definitions

- .1 Demolish: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- .2 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- .3 Existing to Remain: Existing items of construction that are not removed and that are not otherwise indicated as being removed, removed and salvaged, or removed and reinstalled.
- .4 Hazardous Materials: Dangerous substances, dangerous goods, hazardous commodities and hazardous products may include asbestos, mercury and lead, PCB's, poisons, corrosive agents, flammable substances, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by the Federal Hazardous Products Act (RSC 1985) including latest amendments.

1.4 Reference Standards

- .1 ASTM:
 - .1 ASTM A792/A792M-21a, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
- .2 CSA Group (CSA):
 - .1 CSA Z783:21, Deconstruction of Buildings and Their Related Parts
- .3 Department of Justice Canada:
 - .1 Hazardous Products Act, 1985

1.5 Administrative Requirements

- .1 Coordination: Coordinate with Consultant for the material ownership as follows:

- .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from the Project site.
- .2 Coordinate selective demolition work so that work of this Section adheres to aesthetic criteria established by the Drawings and specified dimensions with all elements in planes as drawn, maintaining their relationships with all other building elements.

.2 Scheduling:

- .1 Maintain project schedule without compromising specified minimum material diversion rates.
- .2 Notify the Consultant of unforeseen delays, in writing.

1.6 Description

- .1 This section of the Work includes, but is not necessarily limited to, the following:
 - .1 Demolition, removal completely from site, and disposal of all identified components, materials, equipment and debris.
 - .2 All material from demolition shall be removed from site immediately with no salvage, selling, sorting or burning permitted on site.
 - .3 Retain items indicated on drawings for re use in new construction

1.7 Debris

- .1 Make all arrangements for transport and disposal of all demolished materials from the site.

1.8 Equipment

- .1 Provide all equipment required for safe and proper demolition of the building interiors indicated.

1.9 Action and Informational Submittals

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit the following action submittals before starting work of this Section:
 - .1 Schedule of Demolition Activities: in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.
- .3 Submit copies of the following, when required by the authority having jurisdiction (AHJ):
 - .1 reviewed shop drawings;
 - .2 reviewed demolition procedures.

1.10 Quality Assurance

- .1 Licensed Professional Qualifications: In accordance with Section 01 43 00 - Quality Assurance.

1.11 Site Conditions

- .1 Owner will occupy portions of building immediately adjacent to selective demolition area:

- .1 Conduct selective demolition so that Owner's operations will not be disrupted.
- .2 Provide not less than five [5] days notice to Owner of activities that will affect operations.
- .2 Maintain access to existing means of egress, walkways, corridors, exits, and other adjacent occupied or used facilities:
 - .1 Do not close or obstruct means of egress, walkways, corridors, exits, or other occupied or used facilities without written acceptance from authorities having jurisdiction.
- .3 Consultant and Owner assumes no responsibility for condition of areas to be selectively demolished:
 - .1 Conditions existing at time of Pre-Bid Site Review will be maintained by Owner as far as practical.
- .4 Hazardous Materials are not expected to be encountered in the Work. Notify the Consultant and Owner's Representative immediately if anything resembling Hazardous Materials is encountered on site.
- .5 Stop work immediately and take preventative measures if unmarked material resembling spray- or trowel-applied asbestos or other Hazardous Materials is encountered.
 - .1 Notify the Owner and Consultant immediately.
 - .2 Proceed with Work after receipt of written instructions from the Consultant.

2.0 PRODUCTS

2.1 Material Ownership

- .1 Coordinate material ownership with the Owner and Consultant.
 - .1 The Owner will retain ownership of:
 - .1 items to remain;
 - .2 items to be re-used;
 - .3 items to be re-installed;
 - .4 other items of interest or value to the Owner that may be encountered during demolition.
 - .2 Take possession of demolished materials and remove from site.

2.2 Repair Materials

- .1 Use repair materials identical to existing materials.
 - .1 If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces as closely as possible.
 - .2 Use materials whose installed performance equals or surpasses that of existing materials.

3.0 EXECUTION

3.1 Examination

- .1 Review existing conditions and coordinate with indicated requirements to determine the extent of demolition required.
- .2 Review record documents of the existing facility available from the Owner or Consultant.
- .3 The Owner or Consultant does not guarantee record documents are accurate, complete, or appropriate.
- .4 When unforeseen structural, mechanical, electrical, or other issues are encountered that interfere with demolition or removal, investigate and measure the nature and extent of the interference. Promptly submit a written report to the Owner and Consultant.

3.2 Preparation

- .1 Protection of In-Place Conditions:
 - .1 Minimize noise, dust, vibration, and inconvenience to occupants in accordance with Section 01 14 00 – Work Restrictions.
 - .2 Protect building systems, utilities, equipment, landscaping, and any other items to remain.
 - .3 Provide temporary dust screens, covers, railings, supports, and other protection in accordance with Section 01 52 00 – Construction Facilities.
 - .4 Protect interior items exposed to the weather in accordance with Section 01 52 00.

3.3 Demolition

- .1 Demolish or remove select building items in accordance with CSA Z783-2021.
 - .1 Luminaires and Wall Switches according to Lighting Drawings
 - .2 Natatorium Suspended Anchorage

3.4 Patching and Repairing

- .1 Floors and Walls:
 - .1 Where walls or partitions that are demolished extend from one finished area into another, patch and repair floor and wall surfaces in the new space.
 - .2 Provide a level and smooth surface having uniform finish colour, texture, and appearance.
 - .3 Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance.
 - .4 Patch with durable seams that are as invisible as possible.
 - .5 Provide materials and comply with installation requirements specified in other Sections.
 - .6 Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply the final paint coat over the entire unbroken surface containing the patch. Provide additional coats until the patch blends with adjacent surfaces.

- .7 Ceilings: patch, repair, or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

END OF SECTION

INTERIOR REPAIRS

1.0 GENERAL

1.1 Related Work

- .1 Summary of Work – Section 01 11 00
- .2 Selective Demolition – Section 02 41 19
- .3 Interior Painting – Section 09 91 23

1.2 References

- .1 BC Building Code 2024 (BCBC)
- .2 CSA – A82.31 – Gypsum Wall Board Application
- .3 Association of Wall and Ceilings Contractors of British Columbia Manual

1.3 Scope of Work

- .1 Supply all labour, material, equipment, supervision, and incidentals necessary to re-instate the interior walls, finished floors and ceilings, removed, or damaged during the rehabilitation work, as directed by the Consultant and Owner's Representative.

2.0 PRODUCTS

2.1 Materials

- .1 Replace or repair all materials removed or damaged to the existing standard or better.

3.0 EXECUTION

3.1 Protection

- .1 Protect installed work of other trades from staining or contamination.

3.2 Application

- .1 Drywall Finishing
 - .1 General: Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration. Pre-fill open joints and rounded or bevelled edges, if any, using type of compound recommended by manufacturer.
 - .2 Apply joint tape at joints between gypsum boards, except where a trim accessory is indicated.
 - .3 Apply joint compound in three [3] coats (not including prefill of openings in base), and sand between last two [2] coats and after last coat.
 - .4 Partial Finishing: Omit third coat (if specified) and sanding on concealed drywall work which is indicated for drywall finishing or which requires to achieve fire-resistance rating, sound rating of to act as air or smoke barrier.

- .5 Prime and paint drywall in accordance with Section 09 91 23.
- .2 Wood Trim Installation
 - .1 Install primed wood trim as required and as indicated.
 - .2 Replace all trim damaged as a result of rehabilitation work.
 - .3 Install trim true, level, and plumb.
 - .4 Set finishing nails and fill with wood filler.
 - .5 Paint trim to match existing in accordance with Section 09 91 23.
- .3 Painting:
 - .1 Painting shall match the existing. Paint from corner to corner. All painting or staining work shall be in accordance with MPI Premium
 - .2 Grade finish requirements.
 - .3 All materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents etc.) shall be in accordance with the MPI Painting Specification Manual Approved Product Listing (APL) and shall be from a single manufacturer for each system used.
 - .4 Materials, conditions, surface preparation of substrates, workmanship, quality control, protection and clean-up shall conform to requirements of the latest edition of Master Painters Institute Architectural Painting Specification Manual as issued by the local MPI Accredited Quality Assurance Association having jurisdiction.
 - .5 All materials and paints shall be lead and mercury-free. Use only materials that meet the VOC limits outlined by the State of California's South Coast Air Quality Management District's Rule 1113- Architectural Coatings.
 - .6 The Paint Contractor shall have a minimum of five (5) years proven satisfactory experience and shall show proof before commencement of work that they will maintain a qualified crew of painters throughout the duration of the work.
 - .7 Paint exposed conduits, pipes, hangers, ductwork and other mechanical and electrical equipment with colour and texture to match adjacent surfaces, except as noted otherwise. Coordinate with mechanical trades applying banding and labelling after pipes have been painted.
- .4 Cleaning
 - .1 Re-instate wall accessories, furnishings and similar.
 - .2 Leave carpets, walls and adjacent surfaces in a dust-free condition.

END OF SECTION

INTERIOR PAINTING

1.0 GENERAL

1.1 Related Requirements

- .1 Section 01 78 00 - Closeout Submittals
- .2 Section 09 25 00 – Interior Repairs

1.2 Submittals

- .1 Provide records of products used. List products in relation to finish system and include the following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers.
 - .4 MPI Environmentally Friendly classification system rating.
 - .5 Manufacturer's Safety Data Sheets (SDS).
- .2 Certificates: Provide certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties. MPI Gateway #.
- .3 Manufacturer's Instructions:
 - .1 Provide manufacturer's installation and application instructions.

1.3 Closeout Submittals

- .1 Provide in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: Provide operation and maintenance data for painting materials for incorporation into manual.

1.4 Maintenance Material Submittals

- .1 Extra Stock Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

1.5 Quality Assurance

- .1 Qualifications:
 - .1 Contractor: to have a minimum of five [5] years proven satisfactory experience.
 - .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.
 - .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
 - .4 Conform to latest MPI requirements for exterior painting work including preparation and priming.

- .5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
- .6 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Owner's Representatives and Consultant.

2.0 PRODUCTS

2.1 Materials

- .1 Only Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Interior paint to match existing finishes. Paint colours are to match existing.

2.2 Interior Painting Systems

- .1 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
 - .1 INT 9.2A - Latex finish (over latex primer/sealer).
 - .2 INT 9.2B - High performance architectural latex (over latex primer/sealer) finish.
 - .3 INT 9.2C - Alkyd finish (over latex primer/sealer).
 - .4 INT 9.2CC - Alkyd, W.B. finish.
 - .5 INT 9.2E - Epoxy (tile-like) (over latex primer/sealer) finish.
 - .6 INT 9.2F - Epoxy-Modified Latex (tile-like) finish
 - .7 INT 9.2G - Multicolour (over primer sealer for multi-color systems) finish.
 - .8 INT 9.2H - Fire Retardant, Clear coating (ULC rated).
 - .9 INT 9.2HH - Fire Retardant, Pigmented coating (ULC rated).
 - .10 INT 9.2J - W.B. Fire Retardant coating (ULC rated).
 - .11 INT 9.2K - Latex finish (over alkyd primer /sealer).
 - .12 INT 9.2L - W.B. light industrial (over latex primer/sealer) coating.
 - .13 INT 9.2M - Institutional low odour VOC (over primer sealer, low odour low VOC) finish.
 - .14 Epoxy High Build (over latex sealer).

3.0 EXECUTION

3.1 Manufacturer's Instructions

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

3.2 General

- .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Mud and tape damaged drywall to match paint ready. Painting to be wall to wall.

3.3 Examination

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions.
- .2 Interior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Owner's Representatives and Consultant in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.

3.4 Preparation

- .1 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloth or compressed air.
 - .2 Wash surfaces with a biodegradable detergent and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .4 Allow surfaces to drain completely and allow to dry thoroughly.
 - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
 - .6 Use trigger operated spray nozzles for water hoses.
 - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .2 Provide protective coverings to Owner's properties.

3.5 Application

- .1 Method of application to be as approved by Consultant. Apply paint by brush and/or roller. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

- .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
- .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .4 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

3.6 Mechanical/Electrical Equipment

- .1 Do not paint over nameplates.
- .2 Keep sprinkler heads free of paint.

3.7 Field Quality Control

- .1 Advise Owner's Representatives and Consultant when surfaces and applied coating is ready for inspection.
- .2 Cooperate with the inspection firm and provide access to areas of work.
- .3 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Owner's Representatives and Consultant.

3.8 Restoration

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint slashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Owner's Representatives and Consultant. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Owner's Representatives and Consultant.

END OF SECTION

COMMON WORK RESULTS FOR ELECTRICAL

1.0 GENERAL

- 1.1 The General Conditions, Supplements and Amendments shall govern this Section. This section covers items common to all Electrical sections and is intended to supplement the requirements of Division 01.
- 1.2 The word "Provide" shall mean "Supply and Install" the products and services specified. "As Indicated" means that the item(s) specified are shown on the drawings.
- 1.3 Provide materials, equipment and plant, of specified design, performance and quality; and, current models with published certified ratings for which replacement parts are readily available. Provide project management and on-site supervision to undertake administration, meet schedules, ensure timely performance, ensure coordination, and establish orderly completion and the delivery of a fully commissioned installation.
- 1.4 Codes and Standards
 - .1 Perform complete installation in accordance with the governing edition of CSA C22.1, and the BC Building Code.
 - .2 Comply with CSA Certification Standards and Electrical Bulletins in force at the time of tender submission.
 - .3 Comply with Health and Safety British Columbia guidelines for pool design.
- 1.5 Permits, Fees
 - .1 Submit to Electrical Inspection Department and Supply Authority the necessary number of drawings and specifications for examination and approval prior to commencement of work.
 - .2 Pay associated fees for all permit applications
 - .3 Any additional sets of drawings required will be supplied by the Engineer at a cost of \$5.00 per sheet.
- 1.6 Informational Submittals
 - .1 Submit shop drawings and product data sheets in accordance with Section 01 33 00 – Submittal Procedures. Submit shop drawings for the following equipment:
 - .1 Luminaires and Lamps
 - .2 Lighting Control and Switches
 - .3 Stainless steel aircraft cable and luminaire hangers
 - .2 Shop drawings:
 - .1 Submit wiring diagrams and installation details of equipment, indicating proposed location, layout, and arrangement, control panels, accessories, and other items that must be shown to ensure coordinated installation.
 - .2 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.

- .3 Indicate on drawings clearances for operation, maintenance, and replacement of operating equipment devices.
- .4 Submit one (1) copy of 600 x 600 mm minimum size drawings and product data to authority having jurisdiction and inspection authorities.
- .5 If changes are required, notify Consultant of these changes before they are made.
- .3 Certificates:
 - .1 Provide CSA certified equipment and material.
 - .2 Where CSA certified equipment and material is not available, submit such equipment and material to authority having jurisdiction inspection authorities for special approval before delivery to site.
 - .3 Submit test results of installed electrical systems and instrumentation.
 - .4 Submit, upon completion of Work, load balance report as described in Part 3 - Load Balance.
 - .5 Submit certificate of acceptance from authority having jurisdiction upon completion of Work to Consultant.
 - .6 Manufacturer's Field Reports: submit to Consultant manufacturer's written report, within three [3] days of review, verifying compliance of Work and electrical system and instrumentation testing, as described in Part 3 - Field Quality Control.

1.7 Closeout Submittals

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for electrical equipment for incorporation into manual.
 - .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
 - .2 Operating instructions to include following:
 - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
 - .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
 - .3 Safety precautions.
 - .4 Procedures to be followed in event of equipment failure.
 - .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.
 - .3 Print or engrave operating instructions and frame under glass or in approved laminated plastic.
 - .4 Post instructions where directed.

- .5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
- .6 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.8 Delivery, Storage and Handling

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect electrical equipment from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

2.0 PRODUCTS

2.1 Design Requirements

- .1 Operating voltages: to CAN3-C235
- .2 Luminaires, lamps, control systems, distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
 - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

2.2 Materials and Equipment

- .1 Material and equipment to be CSA certified. Where CSA certified material and equipment is not available, obtain special approval from authority having jurisdiction before delivery to site and submit such approval as described in Part 1 - Action and Informational Submittals.
- .2 Factory assemble control panels and component assemblies.

2.3 Warning Signs

- .1 Warning Signs: in accordance with the requirements of the Authority Having Jurisdiction.
- .2 Decal signs, minimum size 175 x 250 mm.

2.4 Wiring Terminations

- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

2.5 Equipment Identification

- .1 Identify electrical equipment with nameplates and labels as follows:
 - .1 Nameplates: lamicoïd 3 mm thick plastic engraving sheet, matt white finish face, black core, lettering accurately aligned and engraved into core and mechanically attached with self tapping screws.
 - .2 Sizes as follows:

NAMEPLATE SIZES			
Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

- .2 Labels: embossed plastic labels with 6 mm high letters unless specified otherwise.
- .3 Wording on nameplates and labels to be approved by Consultant prior to manufacture.
- .4 Allow for minimum of twenty-five [25] letters per nameplate and label.
- .5 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.
- .6 Disconnects, starters and contactors: indicate equipment being controlled and voltage.
- .7 Terminal cabinets and pull boxes: indicate system and voltage.
- .8 Transformers: indicate capacity, primary and secondary voltages.

2.6 Wiring Identification

- .1 Identify wiring with permanent indelible identifying markings, coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA C22.1
- .4 Use colour coded wires in communication cables, matched throughout system.

2.7 Finishes

- .1 Shop finish metal enclosure surfaces by application of rust-resistant primer inside and outside, and at least two coats of finish enamel.
 - .1 Paint outdoor electrical equipment "equipment green" finish
 - .2 Paint indoor switchgear and distribution enclosures light gray.

3.0 EXECUTION

3.1 Installation

- .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise
- .2 Do overhead and underground systems in accordance with CAN/CSA-C22.3 No.1 except where specified otherwise

3.2 Nameplates and Labels

- .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed

3.3 Conduit and Cable Installation

- .1 If plastic sleeves are used in fire-rated walls or floors, remove them before conduit installation.
- .2 Install cables, conduits and fittings embedded or plastered over, close to building structure so furring can be kept to minimum.

3.4 Location of Outlets

- .1 Locate outlets in accordance with Section 26 05 32 - Outlet Boxes, Conduit Boxes and Fittings.
- .2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.
- .3 Change location of outlets at no extra cost or credit, provided distance does not exceed 3000 mm, and information is given before installation.
- .4 Locate light switches on latch side of doors.

3.5 Mounting Heights

- .1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
- .3 Adjust mounting heights to accessible heights to meet the BC Building Code where applicable.
- .4 Install electrical equipment at following heights unless indicated otherwise:

Device	Height (mm)	Comment
Local Switches	1200	
Wall Receptacle/data	300	General
Wall Receptacle/data	200	Above top of continuous baseboard
Wall Receptacle/data	175	Above top of counters or counter splash backs
Wall Receptacle/data	900	In mechanical rooms
Exterior Receptacles	600	
Panelboards	1500	As required by Code or as indicated – Not more than 1700mm AFF to circuit breaker
Wall mtd telephone	1500	
Thermostat/Card Reader	1200	Confirm before installation
Fire alarm stations	1300	
Wall Mounted Luminaires	2140	

Fire alarm horn/audio	2300	Not closer than 500mm to ceiling
Fire alarm visual devices	2000	Not closer than 150mm to ceiling
Fire alarm Annunciator	1800 Top	Not more than 1800 AFF
End of line resistors	1800	
Television outlets	300	
Wall Mounted Clocks	2300	
Door bell pushbuttons	1500	
Emergency Lighting		300mm below ceiling or 2300mm max.
Exit Lights		300mm below ceiling or 450mm max above door

3.6 Co-Ordination of Protective Devices

- .1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings

3.7 Field Quality Control

- .1 Load Balance:
 - .1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.
 - .2 Provide upon completion of work, load balance report as directed in Part 1 - Action and Informational Submittals, phase and neutral currents on panelboards, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.
- .2 Conduct following tests in accordance with Section 01 45 00 - Quality Control.
 - .1 Power distribution system including phasing, voltage, grounding and load balancing.
 - .2 Earth Fault Loop Impedance Test – On new and affected grounding systems.
 - .3 Motors, heaters and associated control equipment including sequenced operation of systems where applicable.
 - .4 Insulation resistance testing:
 - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
 - .2 Check resistance to ground before energizing.
- .3 Submit results of tests to Consultant for review.
- .4 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- .5 Manufacturer's Field Services:
 - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product.
 - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.8 System Startup

- .1 Instruct operating personnel in operation, care and maintenance of systems, system equipment and components.
- .2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.
- .3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.

3.9 Cleaning

- .1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

WIRE AND BOX CONNECTORS

1.0 GENERAL

1.1 Related Requirements

- .1 This section of the specification forms part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts.

2.0 PRODUCTS

2.1 Materials

- .1 Pressure type wire connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit copper conductors as required.
- .2 Fixture type splicing connectors to: CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit copper conductors 10 AWG or less.
- .3 Bushing stud connectors: to NEMA to consist of:
 - .1 Connector body and stud clamp for stranded copper conductors.
 - .2 Clamp for stranded copper conductors.
 - .3 Clamp for stranded aluminum conductors.
 - .4 Stud clamp bolts.
 - .5 Bolts for copper conductors.
 - .6 Bolts for aluminum conductors.
 - .7 Sized for conductors as indicated.
- .4 Clamps or connectors for armored cable, TECK cable aluminum sheathed cable, mineral insulated cable, flexible conduit, non-metallic sheathed cable as required to: CAN/CSA-C22.2 No.21.

3.0 EXECUTION

3.1 Installation

- .1 Remove insulation carefully from ends of conductors and:
 - .1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.
 - .2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No.65
 - .3 Install fixture type connectors and tighten to CAN/CSA-C22.2 No.65. Replace insulating cap.
 - .4 Install bushing stud connectors in accordance with NEMA.

END OF SECTION

WIRES AND CABLES 0-1000 V

1.0 GENERAL

1.1 Related Requirements

- .1 Section 26 05 00 - Common Work Results for Electrical
- .2 Section 26 05 20 - Wire and Box Connectors - (0-1000 V)
- .3 Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings

2.0 PRODUCTS

2.1 Conductor Material

- .1 Copper: All branch wiring and consumer feeders smaller than #4/0 to be copper.

2.2 Building Wires

- .1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.
- .2 Location: Installed in concealed raceway.
- .3 Type: RW90 with insulation of cross-linked thermosetting polyethylene material.

2.3 Armoured Cables

- .1 Conductors: Copper RW90 XLPE insulated, size as indicated.
- .2 Armour: interlocked aluminum, PVC jacketed.
- .3 Type: ACWU90 – PVC jacket over armour meeting requirements of FT-4.
- .4 Connectors: to manufacturer's recommendations.

3.0 EXECUTION

3.1 Field Quality Control

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform load balance tests using method appropriate to site conditions and to approval of Consultant and local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.

3.2 General Cable Installation

- .1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 V).
- .2 Cable Colour Coding: to Section 26 05 00 - Common Work Results for Electrical.
- .3 Conductor length for parallel feeders to be identical.

- .4 Branch circuit conductor sizes to meet minimum sizes specified and code requirements for voltage drop.
- .5 Feeder runs shown on the drawings are general routing only. Confirm exact routing on site. For any revisions to general routing, ensure feeders meet code requirements for voltage drop at no additional cost.
- .6 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.
- .7 Wiring in walls: typically drop or loop vertically from above to better facilitate future renovations. Generally wiring from below and horizontal wiring in walls to be avoided unless indicated.

3.3 Installation of Building Wires

- .1 Install wiring as follows:
 - .1 In conduit systems in accordance with Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.

3.4 Cable Flame Spread Requirements

- .1 Cables shall meet the flame spread requirements of the BC Building Code and local authorities having jurisdiction.

END OF SECTION

GROUNDING

1.0 GENERAL

1.1 Related Requirements

- .1 Section 26 05 00 - Common Work Results for Electrical

1.2 System

- .1 Install grounding system as indicated and in accordance with Canadian Electrical Code, and electrical inspection Authority Having Jurisdiction.

2.0 PRODUCTS

2.1 Bonding Jumper

- .1 Green insulation, sized by CEC Table 16, sized based on maximum size conductor on load side of overcurrent device protecting the conductor.

3.0 EXECUTION

3.1 Circuit ground conductors

- .1 Install grounding bushings with bonding jumpers at all distribution centres, junction boxes, and enclosures.
- .2 Attach bonding jumpers to grounding bushings on conduits, to lugs on boxes, tubs and other enclosures.
- .3 Connection of ground and neutral made only at the service entrance by connection of neutral to grounding bus.

END OF SECTION

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

1.0 GENERAL

1.1 Related Requirements

- .1 This section of the specification forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 Design Requirements

- .1 Provide equipment supports rated for the supported load.

2.0 PRODUCTS

2.1 Support Channels: U shape, size 41 x 41 mm, 2.5 mm thick, surface mounted, suspended and set in poured concrete walls and ceilings.

2.2 Conduit Hangers: Galvanized steel with special accessories for purpose and adequate to support load imposed.

2.3 Coatings: Supports, support hardware, and fasteners shall be protected with zinc coating or with treatment of equivalent corrosion resistance. Products for use outdoors shall be hot-dip galvanized.

3.0 EXECUTION

3.1 Installation

- .1 Unless otherwise indicated, fasten electrical items and their supporting hardware securely to the building structure.
- .2 Support and align all raceways, cabinets, boxes, fixtures, etc., in an accepted manner and as herein specified. Support all raceways on accepted types of wall bracket.
- .3 Secure equipment to wood construction using wood screws.
- .4 Secure equipment to hollow and solid masonry, tile and plaster surfaces with lead anchors or nylon shields.
- .5 Secure equipment to poured concrete with expandable inserts.
- .6 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.
- .7 Secure surface-mounted equipment with twist clip fasteners to inverted T-bar ceilings. Ensure that T bars are adequately supported to carry the weight of equipment specified before installation.
- .8 Support equipment, conduit or cables using clips, spring-loaded bolts, or cable clamps designed as accessories to basic channel members.
- .9 Fasten exposed conduit or cables to building construction or support system using straps.
 - .1 One-hole steel straps to secure surface conduits and cables 50 mm and smaller.
 - .2 Two-hole steel straps for conduits and cables larger than 50 mm.

- .10 Suspended support systems.
 - .1 Support individual cable or conduit runs with 6 mm diameter threaded rods and spring clips.
 - .2 Support two [2] or more cables or conduits on channels supported by 6 mm diameter threaded rod hangers where direct fastening to building construction is impractical.
- .11 For surface mounting of two [2] or more conduits use channels at 1.5 m on centre spacing.
- .12 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.
- .13 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.
- .14 Do not use wire lashing or perforated strap to support or secure raceways or cables.
- .15 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of Consultant.
- .16 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.

END OF SECTION

OUTLET BOXES, CONDUIT BOXES AND FITTINGS

1.0 GENERAL

1.1 Provide shop drawings to the Consultant for any custom boxes.

2.0 PRODUCTS

2.1 Outlet and Conduit Boxes General

- .1 Size boxes in accordance with CSA C22.1
- .2 102 mm square or larger outlet boxes as required.
- .3 Gang boxes where wiring devices are grouped.
- .4 Blank cover plates for boxes without wiring devices.

2.2 Galvanized Steel Outlet Boxes

- .1 One [1] piece electro-galvanized construction.
- .2 Single and multi-gang flush device boxes for flush installation, minimum size 76 x 50 x 38 mm or as indicated. 102 mm square outlet boxes when more than one conduit enters one [1] side with extension and plaster rings as required.
- .3 Utility boxes for outlets connected to surface-mounted EMT conduit, minimum size 102 x 54 x 48 mm.
- .4 102 mm square or octagonal outlet boxes for lighting fixture outlets.
- .5 Extension and plaster rings for flush mounting devices in finished plaster tile walls.

2.3 Outlet Boxes For Non-Metallic Sheathed Cable

- .1 Electro-galvanized, sectional, screw ganging steel boxes, minimum size 76 x 50 x 63 mm with two [2] double clamps to take non-metallic sheathed cables.

2.4 Fittings - General

- .1 Bushing and connectors with nylon-insulated throats.
- .2 Knock-out fillers to prevent entry of debris.
- .3 Conduit outlet bodies for conduit up to 35mm and pull boxes for larger conduits.
- .4 Double locknuts and insulated bushings on sheet metal boxes.

3.0 EXECUTION

3.1 Installation

- .1 Support boxes independently of connecting conduits.
- .2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.

- .3 For flush installations, mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm of opening.
- .4 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Do not install reducing washers.
- .5 Vacuum clean interior of outlet boxes before installation of wiring devices.
- .6 Identify systems for outlet boxes as required.

END OF SECTION

CONDUITS, CONDUIT FASTENINGS AND CONDUIT FITTINGS

1.0 GENERAL

1.1 Related Requirements

- .1 This section of the specification form part of the Contract Documents and is to read, interpreted and coordinated with all other parts.

1.2 Drawings do not show the quantity of all conduits. Conduits shown on drawings are diagrammatic only.

1.3 Conduit shall be of the type below

- .1 Direct Buried – PVC DBII – duct
- .2 Service Mast for BC Hydro Overhead Service – Rigid Steel (RS)
- .3 Exposed in electrical rooms – E.M.T.
- .4 Concealed in wall or ceiling cavity (Wood Frame) – Lumex or BX Cable
- .5 Exposed in Basement – BX Cable
- .6 Connection to electrical or mechanical equipment that vibrates – flexible conduit (waterproof where subject to damp or wet conditions)

2.0 PRODUCTS

2.1 Conduits

- .1 Polyvinyl chloride DBII duct
- .2 Electrical Metallic Tubing - EMT
- .3 Non-metallic dry sheathed electrical cable – NMD or Loomex
- .4 Armoured metallic sheathed electrical cable - BX
- .5 Rigid galvanized steel threaded conduit - RS
- .6 Liquid-tight flexible conduit - LFMC

2.2 Conduit Fastenings

- .1 One [1] hole steel straps to secure surface conduits 50 mm and smaller.
 - .1 Two [2] hole steel straps for conduits larger than 50 mm.
- .2 Beam clamps to secure conduits to exposed steel work.
- .3 Channel type supports for two or more conduits at 1.5 m on centre.
- .4 Threaded rods, 6 mm diameter, to support suspended channels.

2.3 Conduit Fittings

- .1 Manufactured for use with conduit specified. Coating: same as conduit.
- .2 Ensure factory "ells" where 90 degrees bends for 25 mm and larger conduits.

2.4 Expansion Fittings for Rigid Conduit

- .1 Weatherproof expansion fittings with internal bonding assembly suitable for 100 mm linear expansion.
- .2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection.
- .3 Weatherproof expansion fittings for linear expansion at entry to panel.

2.5 Fish Cord

- .1 Polypropylene – Tag each end with the location of the other end.

3.0 EXECUTION

3.1 Manufacturer's Instructions

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

3.2 Installation

- .1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
- .2 Conceal conduits except service rooms.
- .3 Use PVC conduit underground.
- .4 Use liquid tight flexible conduit for connection to motors or vibrating equipment in damp, wet or corrosive locations.
- .5 Bend conduit cold:
 - .1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.
- .6 Mechanically bend steel conduit over 21 mm diameter.
- .7 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
- .8 Install fish cord in empty conduits.
- .9 Dry conduits out before installing wire.

3.3 Surface Conduits

- .1 Run parallel or perpendicular to building lines.
- .2 Locate conduits behind infrared or gas-fired heaters with 1.5 m clearance.
- .3 Do not pass conduits through structural members.

- .4 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

3.4 Concealed Conduits

- .1 Run parallel or perpendicular to building lines.

3.5 Conduits In Cast-In-Place Concrete

- .1 Locate to suit reinforcing steel.
 - .1 Install in the centre one-third of concrete slab.
- .2 Protect conduits from damage where they stub out of concrete.
- .3 Install sleeves where conduits pass through slab or wall.

3.6 Conduits In Cast-In-Place Slabs on Grade

- .1 Run conduits 25 mm and larger below slab and encase in 75 mm concrete envelope.
 - .1 Provide 50 mm of sand over concrete envelope below floor slab.

3.7 Conduits Underground

- .1 Slope conduits to provide drainage.
- .2 Waterproof joints (PVC excepted) with heavy coat of bituminous paint.

END OF SECTION

SEISMIC RESTRAINT AND VIBRATION ISOLATION

1.0 GENERAL

1.1 Section Includes

- .1 This section specifies materials and installation for seismic restraint systems for electrical installations.

1.2 Regulatory Requirements

- .1 Restraints shall meet the requirements of the British Columbia Building Code 2024 Edition and amendments.

1.3 Scope

- .1 It is the responsibility of equipment manufacturers to design their equipment so that the strength and anchorage of internal components of the equipment exceeds the force level used to restrain and anchor the unit itself to the supporting structure.
- .2 Provide restraint on all equipment and machinery, which is part of the building electrical services and systems, to prevent injury or hazard to persons and equipment in and around the structure. Restrain all such equipment in its normal position in the event of an earthquake.
- .3 The Contractor shall be aware of, and comply with, all current seismic restraining requirements and make provision for those that may come into effect during construction of the project. Make proper allowance for such conditions in the tender.
- .4 Provide seismic restraints on all equipment, and/or installations or assemblies, which are suspended, pendant, shelf mounted, freestanding and/or bolted to the building structure or support slabs.
- .5 Include all costs associated with the Seismic installation and certification in the base tender.

2.0 EXECUTION

2.1 General

- .1 All seismic restraints systems shall conform to local authority having jurisdiction and all applicable code requirements.

2.2 Conduits

- .1 Provide restraint installation information and details on conduit and equipment as indicated below:
- .2 Vertical Conduit:
 - .1 Attachment – Secure vertical conduit at sufficiently close intervals to keep the conduit in alignment and carry the weight of the conduit and wiring. Stacks shall be supported at their bases and, if over two [2] storeys in height, at each floor by approved metal floor clamps.
 - .2 At vertical conduit risers, wherever possible, support the weight of the riser, at a point or points above the center of gravity of the riser. Provide lateral guides at the top and bottom of the riser, and at intermediate points not to exceed 9.2 m [30 ft] O.C.
 - .3 Riser joints shall be braced or stabilized between floors.

.3 Horizontal Conduits:

- .1 Supports – Horizontal conduit shall be supported at sufficiently close intervals to keep it in alignment and prevent sagging.
- .2 EMT tubing – tubing shall be supported at approximately 1.2 m [4ft] intervals for tubing.
- .4 Provide transverse bracing at 12.2 m [40 ft] intervals maximum unless otherwise noted. Provide bracing at all 90 degree bend assemblies, and pull box locations.
- .5 Provide longitudinal bracing at 24.4 m [80ft] intervals maximum unless otherwise noted.
- .6 Do not brace conduit runs against each other. Use separate support and restraint system.
- .7 Support all conduits in accordance with the capability of the pipe to resist seismic load requirements indicated.
- .8 Trapeze hangers may be used. Provide flexible conduit connections where conduits pass through building seismic or expansion joints, or where rigidly supported conduits connect to equipment with vibration or seismic isolators.
- .9 A conduit system shall not be braced to dissimilar parts of a building or two dissimilar building systems that may respond in a different mode during an earthquake.
- .10 Provide large enough conduit sleeves through walls or floors to allow for anticipated differential movements with firestopping where required.
- .11 It is the responsibility of the Contractor to ascertain that an appropriate size restraint device be selected for each individual piece of equipment. Submit details on shop drawings. Review with seismic Engineer and submit shop drawings to Consultants for their reference.

2.3 Floor Mounted Equipment

- .1 Bolt all equipment such as transformers and free-standing panelboards to the structure. Design anchors and bolts for seismic force applied horizontally through the center of gravity to seismic force of 0.5g. For equipment which may be subject to resonances, use a nominal 1.0 g seismic force.
- .2 Provide flexible conduit connections between floor-mounted equipment to be restrained and its adjacent associated electrical equipment.

END OF SECTION

COMMISSIONING OF ELECTRICAL

1.0 GENERAL

1.1 Summary

- .1 This Section specifies the Contractor's responsibilities related to commissioning of electrical systems and their contribution to the overall commissioning work specified in the relevant Technical Sections of Division 01 of the Contract Documents.
- .2 Construction Team: Contractor is responsible for performing tests and verification activities specified in the relevant Sections of Division 26 of the Contract Documents, and submitting reports to Consultant.
 - .1 Subcontractors: electrical subcontractors and third-party inspection/testing agencies participate in commissioning activities in coordination with site quality control requirements for Work they are providing.
 - .2 Manufacturers: manufacturers assist verification activities and report on installation, performance and operation of the products/systems they supplied, as specified in the relevant Sections of Division 26.
 - .3 Contractor coordinates the work of subcontractors, inspection/testing agencies, and manufacturers with the commissioning requirements of this Section.
- .3 Commissioning Authority (CxA): the CxA may assign a commissioning specialist with expertise in building electrical systems, to undertake its commissioning responsibilities related to this Section.
- .4 Owner's Representative: Owner will designate a person to represent the interests of the facility related to work specified in the relevant Sections of Division 26.
 - .1 O&M Representative: Owner may designate an additional representative to participate in the commissioning process and facilitate the transfer of electrical systems to the facility's O&M staff.
- .5 The requirements of this Section do not replace testing requirements specified in the relevant Sections of Division 26, or reporting activities to demonstrate compliance with electrical code requirements to the authorities having jurisdiction.

1.2 Acronyms

- .1 BMM - Building Management Manual
- .2 CT - Construction Team
- .3 Cx - Commissioning
- .4 CxA - Commissioning Authority
- .5 O&M - Operation and Maintenance

1.3 Definitions

- .1 Construction Team: the term Construction Team is used in this Section to designate inclusively the Contractor, subcontractors, manufacturers/suppliers and other support disciplines that are responsible for construction/installation of the Work specified in these specifications.

- .2 Cx Forms: forms used to document the inspections, tests and verification activities performed during the commissioning process, as specified in Section 01 91 13 – General Commissioning Requirements

1.4 Reference Standards

- .1 CSA Group (CSA):
 - .1 CSA Z320-11, Building Commissioning
 - .2 CSA Z5000-18, Building Commissioning for Energy Using Systems

1.5 Administrative Requirements

- .1 Construction Team – Cx Representative: Contractor to designate a person from the Construction Team to review and coordinate commissioning activities specified in this Section.
 - .1 Representative to be acceptable to Owner's Representative, Consultant and CxA with the following qualifications:
 - .1 Technical personnel with a minimum of five [5] years' experience in construction, testing and commissioning of electrical systems.
 - .2 Site supervisor or project manager within the Construction Team, with direct responsibilities for supervising the execution of work specified in the relevant Sections of Division 26.
- .2 Coordination: coordinate the responsibilities of the Construction Team in the Cx process with the responsibilities of other participants that form part of the Cx Team.
 - .1 Coordinate the participation of electrical subcontractors, inspection/testing agencies and manufacturers in reviewing the submittals and in assisting testing and demonstration activities related to their work.
 - .2 Coordinate commissioning activities with execution of the work during the course of construction to allow Cx participants and the authority having jurisdiction (AHJ) to fulfill their responsibilities for witnessing tests and reviewing installation before concealment of work.
 - .3 Coordinate start-up of electrical motors supplied as specified in the relevant Sections of other Divisions of the Contract Documents, with the equipment supplier.
 - .4 Review interfaces with other work to ensure submittals and installation requirements are coordinated with other trades.
- .3 Notification: notify the Owner's Representative, Consultant and CxA of activities associated with the commissioning process in accordance with Section 01 91 13 – General Commissioning Requirements.
- .4 Commissioning Conferences: conduct commissioning meetings attended by Owner's Representative, Consultant, CxA, and Contractor in accordance with Section 01 91 13 - General Commissioning Requirements and as follows:
 - .1 Before starting work: to review mock-up requirements and factory testing of systems, components and/or equipment.
 - .2 During execution of work but before start of commissioning activities: to refine commissioning documentation and commissioning schedule.

- .5 Sequencing: perform commissioning activities in general accordance with the commissioning process described in CSA Z320 and CSA Z5000 , maintaining the systematic approach to completing and obtaining acceptance for each phase of commissioning in particular with regards to static verification, start-up and functional performance testing.
 - .1 Functional Performance Testing (FPT): perform operational and performance testing by phases starting with individual components and equipment, testing of sub-systems and then proceeding to FPT of overall systems.
 - .2 Integrated Systems: only perform commissioning of integrated systems once the FPT for each individual system forming part of the integrated system has been completed.
 - .3 Demonstration and training activities may form part of certain commissioning activities, as agreed by Owner's Representative and CxA.

1.6 Action and Informational Submittals

- .1 Provide required information in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Electrical Cx Schedule:
 - .1 Submit proposed schedule before start of commissioning conferences indicating key activities critical to the commissioning process including:
 - .1 Inspection of electrical systems.
 - .2 Commissioning phases: static verification, start-up, functional performance testing, systems orientation, O&M manuals submissions, training sessions.
 - .3 Integrated Testing activities.
 - .4 Review activities to be completed by other participants: Owner's Representative Consultant CxA.
 - .2 Review the proposed schedule through the course of the work and notify the Owner's Representative Consultant CxA of modifications required.
- .3 Commissioning Forms: Contractor to review and complete forms for documenting static verification and start-up activities in accordance with Section 01 91 13 – General Commissioning Requirements Section 01 91 13.16 – Commissioning Forms.
 - .1 Approved Cx Forms: CxA reviews and approves the final format to use through the commissioning process.
 - .1 Review the forms proposed by CxA and submit comments with proposed adjustments.
 - .2 Contractor may submit its own preferred format for review by the CxA. This may include manufacturer provided checklists.
 - .2 Submit completed static verification and start-up checklists within [48] hours of completion of verification of equipment or system.
- .4 Testing Equipment: submit a list of proposed testing equipment for performing electrical Cx activities and related tests in accordance with Section 01 91 13 – General Commissioning Requirements.

- .5 Site Quality Control Submittals: submit manufacturers certificates and reports demonstrating compliance of Work, as specified in the relevant Sections of Division 26.

1.7 Closeout Submittals

- .1 Submit O&M data and as-built information in accordance with Section 01 78 00 – Closeout Submittals.
 - .1 Site Modifications: record changes to installations, system configuration and/or controls that were made during the commissioning process to meet the required performance of electrical equipment and systems.

2.0 PRODUCTS

2.1 Equipment

- .1 Furnish special tools or equipment required for:
 - .1 Verifying or adjusting equipment/system components.
 - .2 Accessing equipment, enclosures or control cabinets.
- .2 Furnish instruments and equipment required to perform testing and validate performance of electrical systems through the commissioning process or as specified in the relevant Sections of Division 26.

3.0 EXECUTION

3.1 Static Verification

- .1 Perform static verification of components, equipment and systems in accordance with – General Commissioning Requirements and complete the approved Cx Forms in coordination with performing the following activities:
 - .1 Verify installation and connection of equipment, sub-systems and systems.
 - .2 Confirm accessibility to electrical equipment and components for inspection and O&M activities.
 - .3 Record equipment and systems information including: manufacturer, model number, serial number and rated capacities.
 - .4 Confirm completion of labelling and identification of electrical equipment.
 - .5 Confirm identification of circuits in each distribution panel including: circuit labels and a clear panel legend showing the load and a short description of each circuit.
 - .6 Confirm completion and documentation of equipment prestart-up tests, including manufacturer's factory tests.
 - .7 Confirm adequate protection of electrical systems during construction.
 - .8 Confirm electrical systems and service entrance are protected from major precipitation events and minor flooding.
 - .9 Confirm electrical cabinets and enclosures are equipped with protective covers.

.10 Confirm seismic and vibration controls for electrical equipment/systems are installed in accordance with design details and manufacturer's recommendations.

- .2 Site Quality Control: CxA to conduct random verification on-site to validate the accuracy of static verification reporting. Contractor to assist the CxA on site to review selected samples representing up to 30 % of the overall installation.

3.2 Start-Up

- .1 Refer to Section 01 91 13 - General Commissioning Requirements for commissioning requirements.
- .2 Perform start-up of equipment and systems in accordance with Section 01 91 13 – General Commissioning Requirements and complete the approved Cx Forms in coordination with performing the following activities:
- .1 Initial site energization.
 - .2 Contractor/manufacturer start-up of equipment.
 - .3 Start-up of electrical systems including site electrical tests, and verification and adjustment.
 - .4 Site electrical tests including:
 - .1 Measurement of voltage and voltage drop at major equipment.
 - .2 Perform proper insulation resistance of electrical circuits, feeders and equipment.
 - .3 Power factor measurements.
 - .5 Verification of proper load balancing.
- .3 Site Quality Control: Consultant will witness start-up activities for selected equipment. Notify the Owner's Representative Consultant CxA of start-up activities by Section 01 91 13 – General Commissioning Requirements.

3.3 Site Quality Control

- .1 Manufacturer's Site Services: obtain certificates and reports from manufacturer verifying compliance of Work and submit Manufacturer's Site Reports as described in Part 1 - Action and Informational Submittals.
- .1 Provide manufacturer's site services to complete start-up activities and assist in Functional Performance Testing as specified in the relevant Sections of Division 26.

3.4 Closeout Activities

- .1 Corrections: Provide equipment, materials and labour as required to correct installation and/or equipment deficiencies identified through the commissioning process.

END OF SECTION

GENERAL REQUIREMENTS FOR LIGHTING

1.0 GENERAL

1.1 Relevant Section

- .1 01 33 00- Submittal Procedures

1.2 Submittals

- .1 Submit Shop drawings for the following
 - .1 Lights
 - .2 Lighting Control and Switches
 - .3 Aircraft Cable Support System

1.3 Summary

- .1 This section includes the supply and install of luminaires, lamps, drivers, trim rings, back boxes, supports and accessories.
- .2 The Luminaire Schedule is on the drawings. Luminaire types are indicated by designations in the schedule and on the plans.

1.4 Submittals

- .1 Base electrical tender amount on luminaires specified by manufacturer's name and product number or substitute equipment that has received prior approval from the Consultant.
- .2 In the Luminaire Schedule, where manufacturer catalogue numbers listed do not match the written description, the contractor is to request clarification from the Consultant prior to ordering.
- .3 Submittal sheets and shop drawings for all luminaires to include Lighting Facts label.
- .4 Provide shop drawings of all luminaires showing all physical characteristics such as material types and thicknesses, support methods, construction details, etc. Include full lamp information as well as shop drawings of all driver types.

1.5 Quality Assurance

- .1 All luminaires are to be LED type complete with LED drivers unless otherwise noted on the lighting schedule.
- .2 Manufacturer must have a history of designing and manufacturing LED luminaires.

2.0 PRODUCTS

2.1 Schedule

- .1 See the Lighting Schedule on the drawings for type of luminaires and catalog numbers. Catalog numbers are shown on the drawings for quality and performance requirements only.
- .2 Luminaire shall be listed by a NRTL (Nationally Recognized Testing Laboratory: eg. cUL, ETL, etc.).

- .3 Provide all products with CSA labels or appropriate approvals for all mounting conditions.

2.2 General Use Lamps

- .1 General Use Incandescent Lamps and Incandescent Reflector Lamps are prohibited. Use LED retrofit lamps or LED luminaires in lieu of incandescent or halogen luminaires. LED retrofit lamps shall be:
 - .1 Rated for the voltage of the incandescent lamp/luminaire they are replacing.
 - .2 Dimmable where required as indicated on the plans.
- .2 Rated for the luminaire in which they are being installed. Verify whether the luminaire is enclosed and whether the LED retrofit lamp is rated for enclosed luminaires and the temperatures that will be encountered.
- .3 LED lamps/luminaires shall provide delivered footcandles equal to or greater than the footcandles provided by an equivalent incandescent lamp/luminaire.
- .4 LED retrofit lamps shall have an average rated life (L70) of 25,000 hours, minimum.
- .5 Lamp colour temperature shall be nearly equal to the incandescent lamp it is replacing.

2.3 LED Luminaires

- .1 Luminaire shall maintain 70% lumen output (L70) for a minimum of 50,000 hours.
- .2 Lumen output shall not depreciate more than 20% after 10,000 hours of use.
- .3 Luminaire and driver shall be furnished from a single manufacturer to ensure compatibility.
- .4 Luminaire Color Rendering Index (CRI) shall be a minimum of 80 for interior luminaires.
- .5 LED luminaire shall be thermally designed as to not exceed the maximum junction temperature of the LED for the ambient temperature of the location the luminaire is to be installed. Rated case temperature shall be suitable for operation in the ambient temperatures typically found for the intended installation.
- .6 The LED luminaire shall carry a limited five [5] year warranty minimum for LED light engine(s)/board array, and driver(s).
- .7 Manage Flicker
 - .1 All luminaires shall meet the following flicker requirements:
 - .1 Recommended practices 1, 2, or 3 as defined by IEEE standard 1789-2015 LED.

2.4 LED Drivers

- .1 Drivers shall be ULC listed and CSA certified.
- .2 Provide driver type (non-dimmed, step-dimmed, continuous-dimming, etc.) as indicated on the luminaire schedule on the drawings.
- .3 Minimum Warranty of five [5] years (not pro-rated) to include LED driver and all LED components.

- .4 Driver shall have a rated life of 50,000 hours, minimum.
- .5 Driver shall have a maximum Total Harmonic Distortion (THD) of <20% at full input power and across specified voltage range.
- .6 LED driver shall be compatible with dimming controls where dimming is indicated on the plans. Dimmable drivers shall use Dimming Constant Current (DCC), Constant Voltage, or Pulse Width Modulation (PWM) operation

2.5 Suspended Luminaires

- .1 Coordinate location and elevation of suspended luminaire with the Consultant prior to installation of hanging cable.
- .2 Utilize existing eyebolt anchors in steel framed ceiling for locating the suspended luminaires.
- .3 Cable suspended luminaires shall be mounted to allow 45-degree swing in any direction from vertical without contacting other luminaires or building components.

2.6 Luminaire Support

- .1 Aircraft cable, hooks, and anchors to be utility-grade stainless steel.
- .2 Aircraft cables to have a minimum breaking strength of 1760 pounds.
- .3 Aircraft cables to be at a minimum 1/8" and 4x19 strand core construction.
- .4 Aircraft cables to be fastened together with stainless steel crimping sleeves.

3.0 EXECUTION

3.1 Delivery and Storage

- .1 Luminaires and other related materials shall be individually wrapped and sealed and substantially crated for shipment. All handling and shipping shall be performed in accordance with Manufacturer's recommendations. Store products in unopened cartons in a protected location.
- .2 No project luminaires are to be used for construction site lighting, before or after installation, without specific written permission from the owner and Consultant.
- .3 Storage and Protection: Upon delivery, the materials shall be stored under cover in a dry and clean location, off the ground. Delivered materials which are damaged or otherwise not suitable for installation shall be removed from the job site and replaced with acceptable materials.
- .4 Replace at no expense to the Owner, all equipment and materials which are damaged during storage or handling.

3.2 Installation

- .1 Luminaires shall be installed as indicated on electrical drawings and per approved shop drawings. Verify locations and spacing of luminaires and notify Consultant of any variance or conflict between the plans and field conditions. Do not proceed until conflict has been resolved.
- .2 Luminaires shall be installed in accordance with lamp and fixture manufacturer's written instructions, applicable requirements of CEC, applicable authorities, and with recognized industry practices.

- .3 All luminaires shall be supported directly from the building structural members. Provide all necessary hardware and blocking to ensure that luminaires hang true, square, plumb, and in proper alignment.
- .4 Luminaires shall be adequately supported and braced to satisfy seismic codes.
- .5 Luminaires, once installed, shall be protected from damage during the remainder of construction period.

3.3 Testing and Adjustment

- .1 Operate each luminaire after installation and connection. Each luminaire shall be inspected for proper connection, operation and dimming.
- .2 Verify that all lenses, louvres, baffles, fixture trim cones, diffusers and other parts are thoroughly cleaned in a manner recommended by the manufacturer.

3.4 Cleaning

- .1 Remove all protective covering, plastic bags and packing materials from luminaires after construction is finished and prior to final acceptance.
- .2 All Luminaires shall be cleaned in a manner approved by the manufacturer and shall be free of dirt and debris upon completion of installation. Reflectors, lenses and diffusers to be wiped free of all dust, smudges and fingerprints.

END OF SECTION

LIGHTING CONTROL

1.0 GENERAL

1.1 Relevant Section

- .1 01 33 00- Submittal Procedures
- .2 26 52 00- General Requirements for Lighting

1.2 Submittals

- .1 Submit Shop drawings for the following
 - .1 Lighting Control System and Switches

1.3 Summary

- .1 This section includes the supply and install of lighting controls and lighting control devices.
- .2 The Luminaire Schedule is on the drawings. Lighting Control schedule and switch allocation are indicated by designations in the schedule and on the plans.

1.4 Submittals

- .1 Base electrical tender amount on products specified by manufacturer's name and product number or substitute equipment that has received prior approval from the Consultant.
- .2 Submittal sheets and shop drawings for all lighting control devices and applications.

1.5 Quality Assurance

- .1 Control System: by one manufacturer and assembled from compatible components.
- .2 Control system to be the same as attached shop drawings. Alternates to be approved by Consultant prior to ordering. If alternate lighting control system is not submitted and approved during the Tender process, the specified system shall be installed.

2.0 PRODUCTS

- 2.1 See project drawings for lighting control system.

3.0 EXECUTION

3.1 Manufacturer's Instructions

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

3.2 Installation

- .1 Install system and components in accordance with manufacturer's recommendations and as shown on the drawings to provide a fully functional system as shown on the drawings and contained herein. Drawings indicate required zoning and light control features. Not all system components for a fully

functional system may be detailed in this specification; provide all necessary components for a fully functional system.

- .2 Install cabling and connect to each component in accordance with the manufacturer's recommendations.
- .3 Adjust each component in the system to function as shown on the drawings and in conjunction with the Owners' directions.
- .4 Measure and adjust all occupancy sensors, colour tunable controls, timer controls, and dimming controls.
- .5 Locations of all Room Controllers, wireless transceivers, lighting control interfaces, etc. shall be noted on Record Drawings.

3.3 Field Quality Control

- .1 On completion of installation a third party representative shall carry out site inspection and verification for the entire lighting control system. Provide a copy of the verification report to the Consultant. Report at a minimum shall contain:

- .1 General Information

- .1 Project name, location, and date of commissioning activities.
- .2 Name of commissioning agent or technician
- .3 Lighting control system manufacturer and model numbers
- .4 Description of the control system (standalone, networked, 0-10V dimming, etc.)

- .2 System Verification

- .1 Confirmation that all lighting control devices (occupancy sensors, switches, dimmers, colour selectors, control panels) are installed according to approved plans and shop drawings.
- .2 Verify device labeling and addressing.
- .3 Check that system wiring matches control diagrams (e.g. low-voltage and line-voltage separation, correct connections).

- .3 Functional Testing

- .1 Manual switch and dimmer operation verification.
- .2 Occupancy sensor functionality (detects motion correctly, times out correctly).
- .3 Timeclock events (lighting schedules turn lights on/off or dim at correct times).
- .4 Scene control or preset functionality.
- .5 Emergency lighting interface (emergency lights activate appropriately under power failure).
- .6 Local override operation (where specified).

- .4 Control Settings Documentation
 - .1 Sensor time delay settings (e.g. 15 minutes vacancy timeout).
 - .2 Sensor sensitivity settings.
 - .3 Lighting level presets or dimming percentages
 - .4 Timeclock schedule details (days, times, zones)
- .5 Sequence of Operations Validation
- .6 Deficiencies and Corrections
 - .1 List any deficiencies found during commissioning.
 - .2 List corrective actions taken (or recommendations for correction if unresolved).
- .7 Attachments
 - .1 Floor plans showing device locations (marked up if necessary).
 - .2 System network topology (for networked lighting control systems).
 - .3 Control system programming files or backup (digital copy)
- .8 Final Sign-Off
 - .1 Signature of Commissioning Agent, Contractor's Representative, and Owner's Representative.
 - .2 Date of final acceptance.

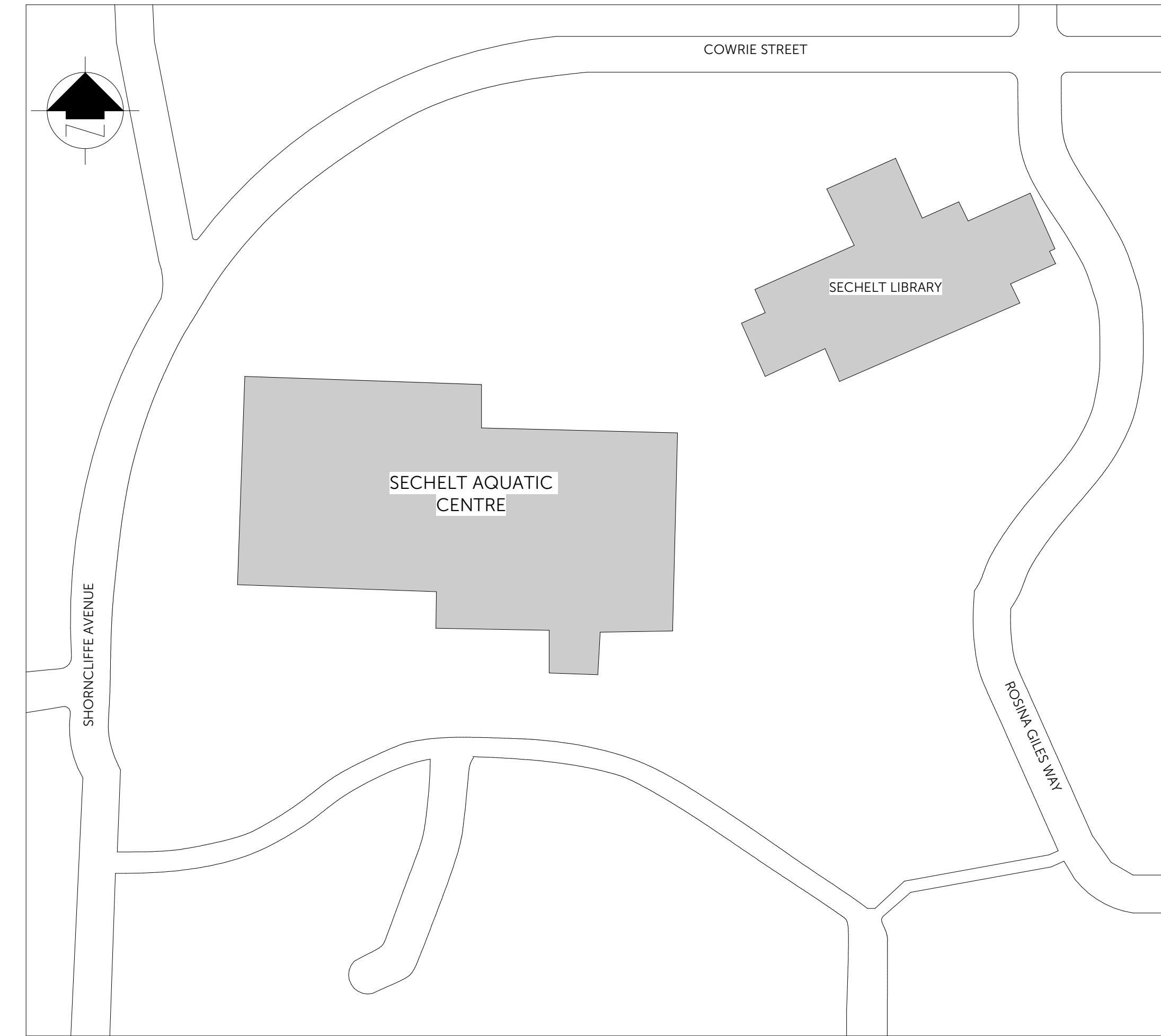
END OF SECTION

Appendix A: Electrical Drawings

LIGHTING UPGRADE

SECHELT AQUATIC CENTRE

5500 SHORNCLIFFE AVENUE, SECHELT, BC



1 SITE PLAN
E-001 SCALE: 1: 600

DRAWING LIST	
SHEET NO.	SHEET TITLE
E-001	COVER SHEET
E-101	FLOOR PLAN WEST
E-102	FLOOR PLAN EAST
E-201	LIGHTING AND PANEL SCHEDULE
E-301	NATATORIUM ELEVATION AND ANCHORAGE DETAILS
E-501	NATATORIUM ILLUMINANCE SIMULATION

PROJECT DATA GENERAL PROPERTY INFORMATION:	
CIVIC ADDRESS:	5500 SHORNCLIFFE AVENUE, SECHELT, BC
PID:	008-246-009
PLAN:	BLOCK 7, PLAN VAP6457, DISTRICT LOT 303, GROUP 1
AHJ:	DISTRICT OF SECHELT
APPLICABLE CODE:	BRITISH COLUMBIA BUILDING CODE (BCBC 2024)
STANDARDS:	CSA C22.1:24 CANADIAN ELECTRICAL CODE (CEC 26TH EDITION) ILLUMINATING ENGINEERING SOCIETY - THE LIGHTING HANDBOOK (10TH EDITION)

SCOPE OF WORK	
1.	REPLACEMENT OF TWENTY-EIGHT (28) LUMINAIRES WITH TWENTY-TWO (22) NEW LUMINAIRES IN THE AQUATIC CENTRE NATATORIUM (POOL ROOM).
2.	REPLACEMENT OF EXISTING NATATORIUM CABLES WITH NEW STAINLESS STEEL, CORROSION RESISTANT CABLES.
3.	REPLACEMENT OF LIGHTING THROUGHOUT BUILDING INCLUDING LOCKER ROOM, OFFICES, COMMUNITY ROOM AND MECHANICAL ROOMS. REPLACEMENT OF WALL SWITCHES WITH DIMMER SWITCHES, OCCUPANCY SWITCHES, AND/OR COLOUR TUNABLE SWITCHES.
4.	RETAIN ALL EXISTING BRANCH WIRING, CIRCUIT BREAKERS, SURFACE MOUNT EMT CONDUIT, JUMPER CABLES, AND CEILING MOUNTED JUNCTION BOXES. REPLACE ANY WIRING OR CONDUIT DAMAGED DURING CONSTRUCTION. INSTALL ADDITIONAL WIRING FOR DIMMING, OCCUPANCY AND COLOUR TUNABLE CONTROL AS NECESSARY.
5.	COORDINATION WITH PROPERTY MANAGERS FOR CONSTRUCTION TIMING, TO COINCIDE WITH ANNUAL MAINTENANCE PERIOD WHEN THE NATATORIUM IS SHUT DOWN

PROJECT TEAM

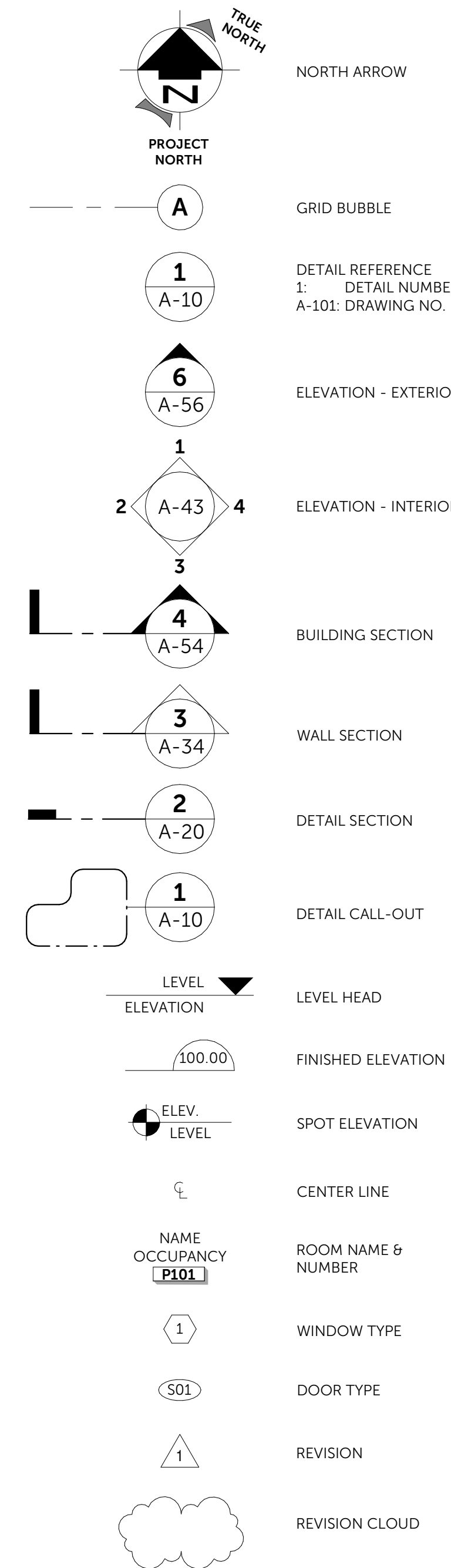
CLIENT
SUNSHINE COAST REGIONAL DISTRICT
1975 FIELD ROAD, SECHELT, BC

CONSULTANT
MCCUAIG & ASSOCIATES ENGINEERING LTD.
200-3999 HENNING DRIVE, BURNABY, BC V5C 6P9

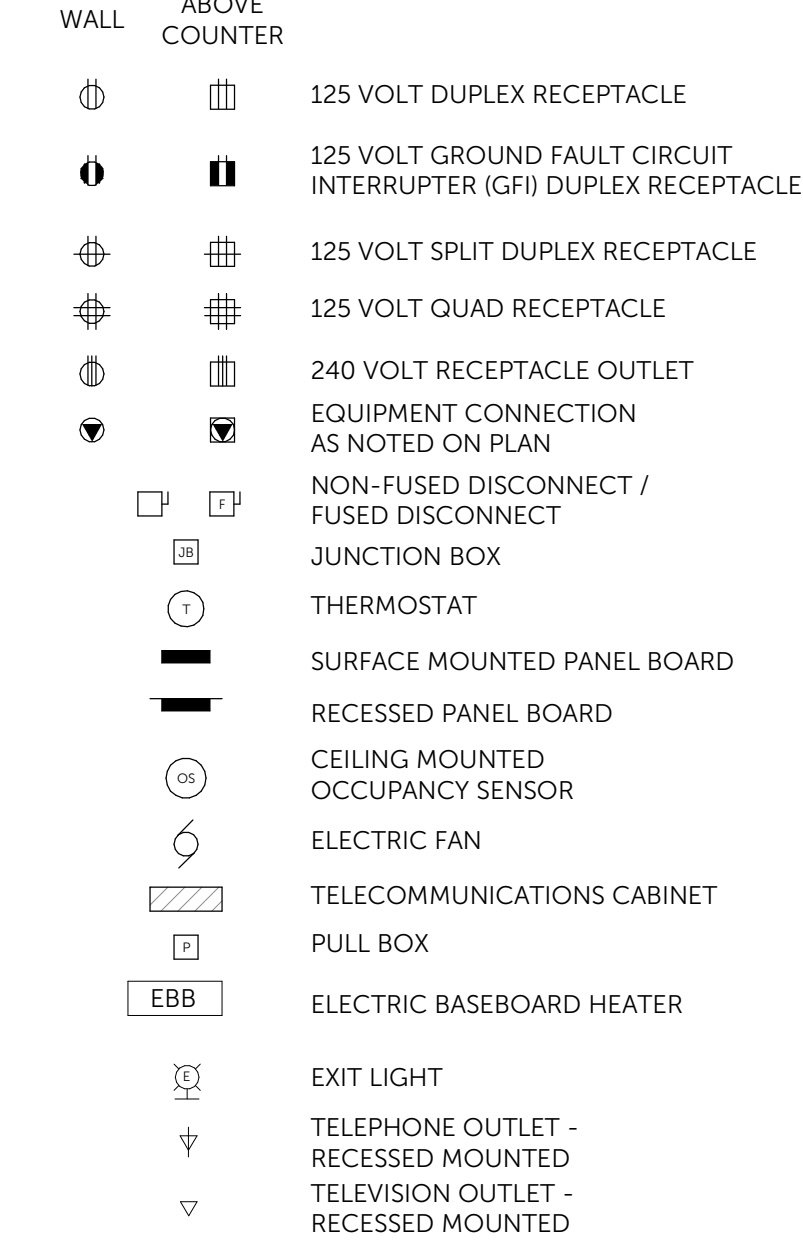
ABBREVIATION

A	AMPERE
AFF	ABOVE FINISHED FLOOR
AT	AMPERE TRIP
AF	AMPERE FRAME
AF	ABOVE FINISHED FLOOR
AL	ALUMINIUM
AWG	AMERICAN WIRE GUIDE
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CONC.	CONCRETE
CONT.	CONTINUOUS
CU	COPPER
C/W	COMPLETE WITH
DIA.	DIAMETER
DRY	DRYER
DW	DISHWASHER
EC	EMPTY CONDUIT
EL	ELEVATION
EQ	EQUAL
ER	EXISTING TO REMAIN
EXT	EXTERIOR
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FSS	FUSED SAFETY SWITCH
GALV	GALVANISED
GFI, GFCI	GROUND FAULT INTERRUPTER
GND	GROUND
HP	HORSEPOWER
IG	ISOLATED GROUND
KW	KILOWATT
KVA	KILO VOLT AMPERES
MCA	MINIMUM CIRCUIT AMPACITY
MIN	MINIMUM
MAX	MAXIMUM
MW	MICROWAVE
REF	REFRIGERATOR
RH	RANGEHOOD
MCB	MAIN CIRCUIT BREAKER
MH	MOUNTING HEIGHT
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTG	MOUNTING
N	NEUTRAL
P	POLE OR PHASE
PL	PROPERTY LINE
PNL	PANELBOARD
PP	POWER POLE
QTY	QUANTITY
REC	RECESSED
RL	RELOCATE EXISTING DEVICE
RM	REMOVE EXISTING DEVICE
RR	REMOVE AND REPLACE WITH NEW DEVICE
T.B.C.	TO BE CONFIRMED
T/O	TOP OF
T.B.D.	TO BE DETERMINED
TEMP	TEMPERATURE
U/G	UNDERGROUND
V	VOLTAGE / VOLTS
W	WATTS
WITH	WITH
WM	WASHING MACHINE
WP	WATERPROOF
XFMR	TRANSFORMER

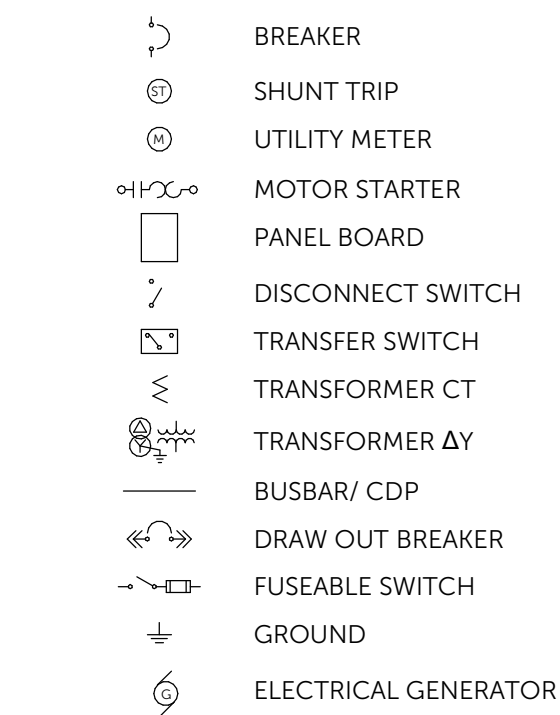
GENERAL DRAFTING SYMBOLS



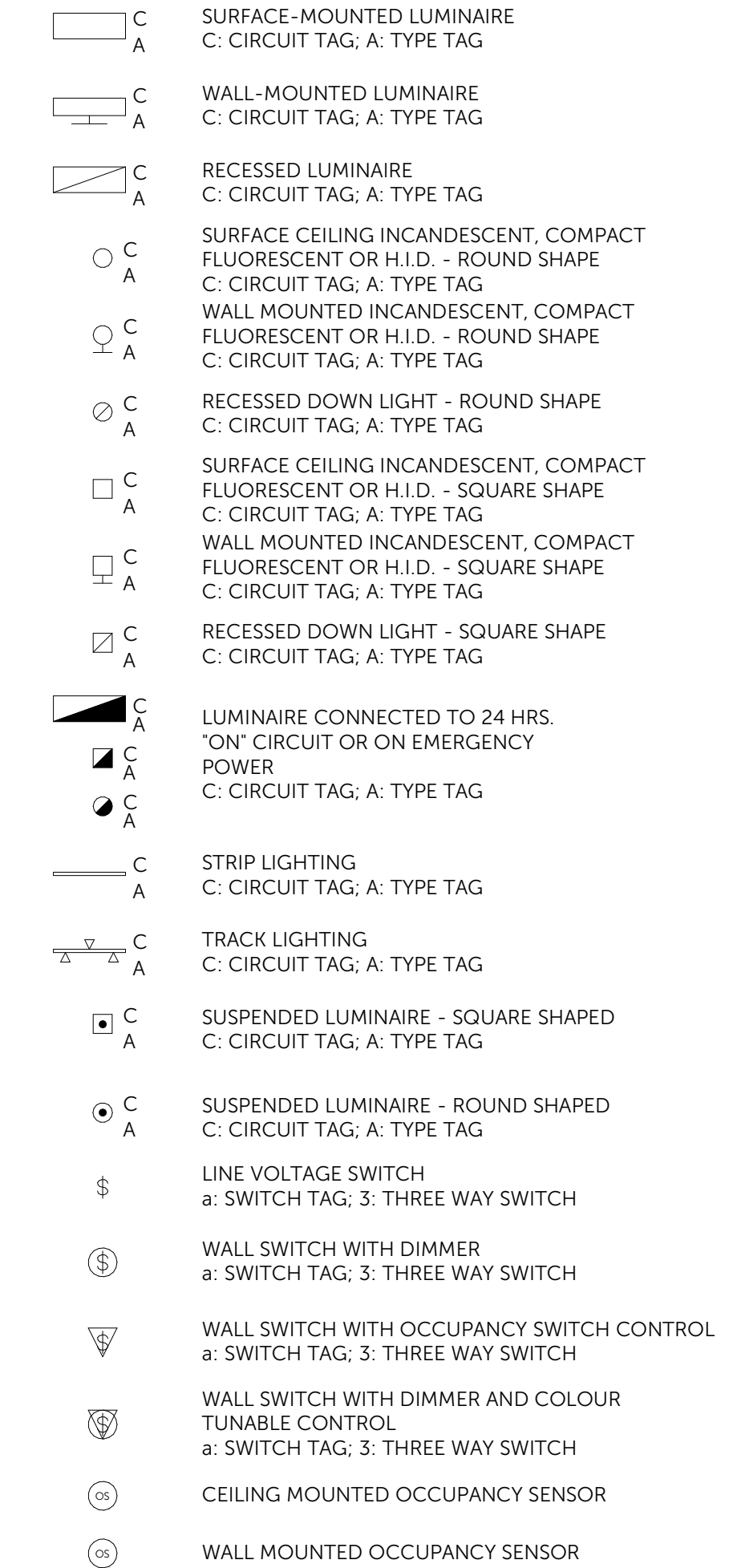
ELECTRICAL LEGEND



SINGLE LINE SYMBOL LEGEND



LUMINAIRE LEGEND



#200 - 3999 HENNING DRIVE, BURNABY, BC, V5C 6P9
PHONE: 604-255-0992 / FAX: 604-255-1054

ONLY VALID FOR PERMIT WHEN SEALED AND SIGNED.

PERMIT TO PRACTICE NO. (BC): 1002833

5	ISSUED FOR TENDER	2026/01/22
4	ISSUED FOR PERMIT	2025/11/17
3	ISSUED FOR 100% CLIENT REVIEW #2	2025/10/28
2	ISSUED FOR 100% CLIENT REVIEW	2025/09/12
1	ISSUED FOR 75% CLIENT REVIEW	2025/02/24

CLIENT
SUNSHINE COAST REGIONAL DISTRICT
1975 FIELD ROAD,
SECHELT, BC

PROJECT TITLE
LIGHTING UPGRADE
SECHELT AQUATIC CENTRE
5500 SHORNCLIFFE AVENUE, SECHELT, BC

CHECKED BY	CS	DRAWN BY	MJM
SCALE	As indicated	DATE	2025/02/24

DRAWING TITLE
COVER SHEET

SHEET NO.	PROJECT NUMBER
E-001	2411.013
REVISION NO.	5

NOTE: FIELD VERIFY ALL MEASUREMENTS. DO NOT SCALE OFF DRAWINGS



#200 - 3999 HENNING DRIVE, BURNABY, BC, V5C 6P9
PHONE: 604-255-0992 / FAX: 604-255-1054

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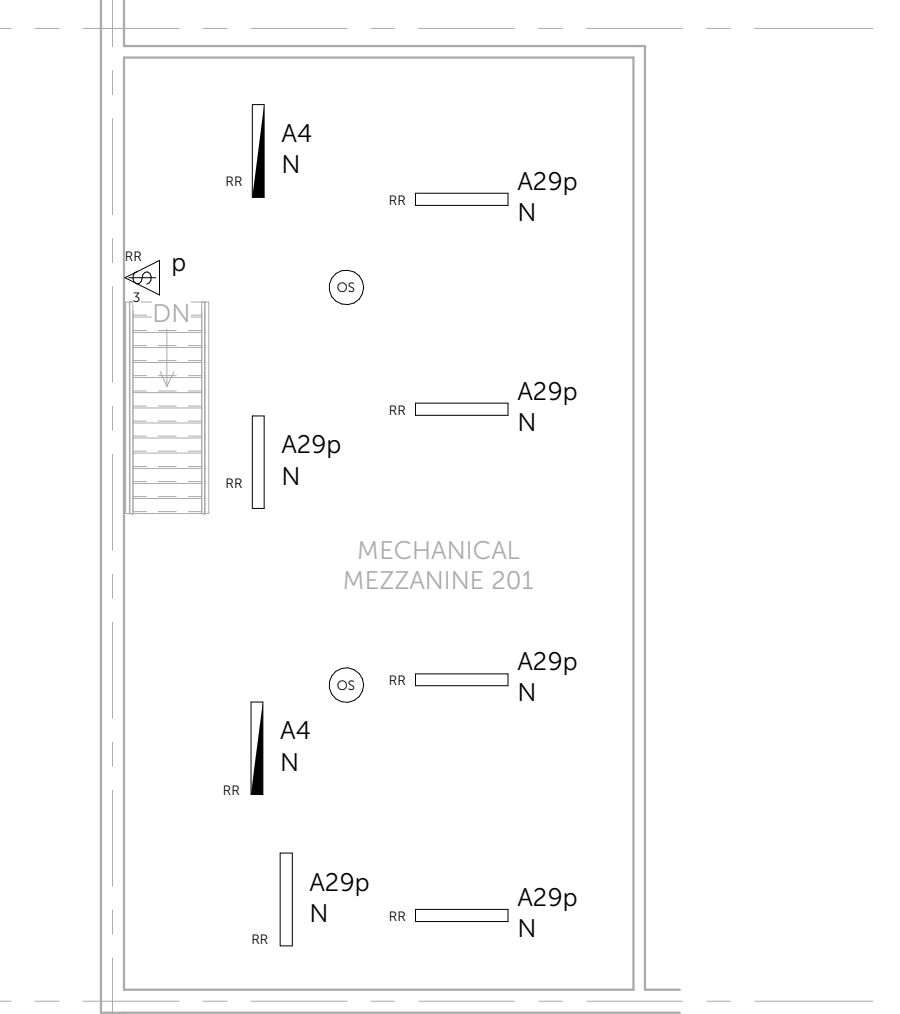
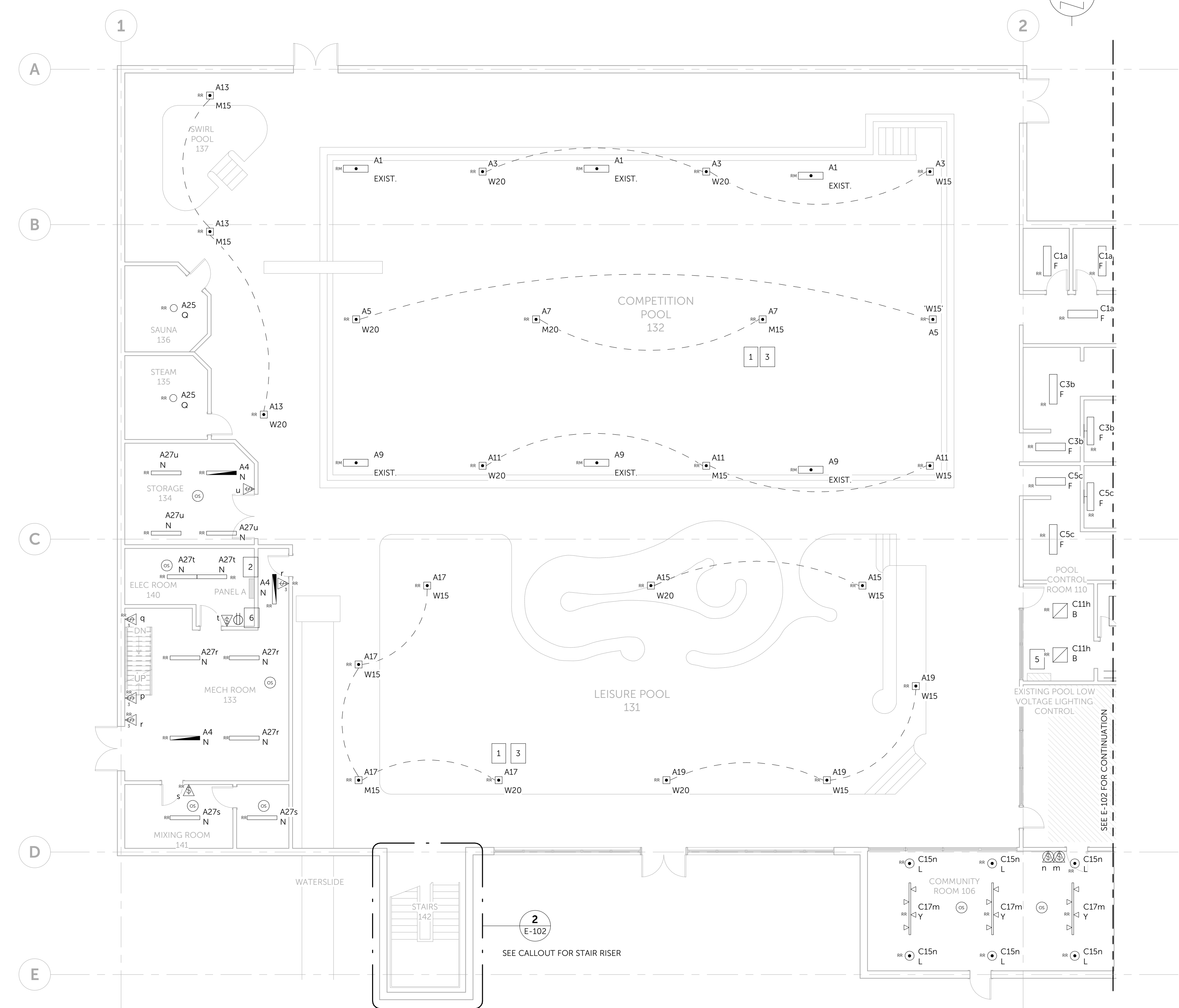
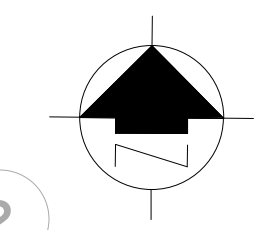
CLIENT
SUNSHINE COAST REGIONAL DISTRICT
1975 FIELD ROAD,
SECHLT, BC

PROJECT TITLE
LIGHTING UPGRADE
SECHLT AQUATIC CENTRE
5500 SHORNLIFFE AVENUE, SECHLT, BC

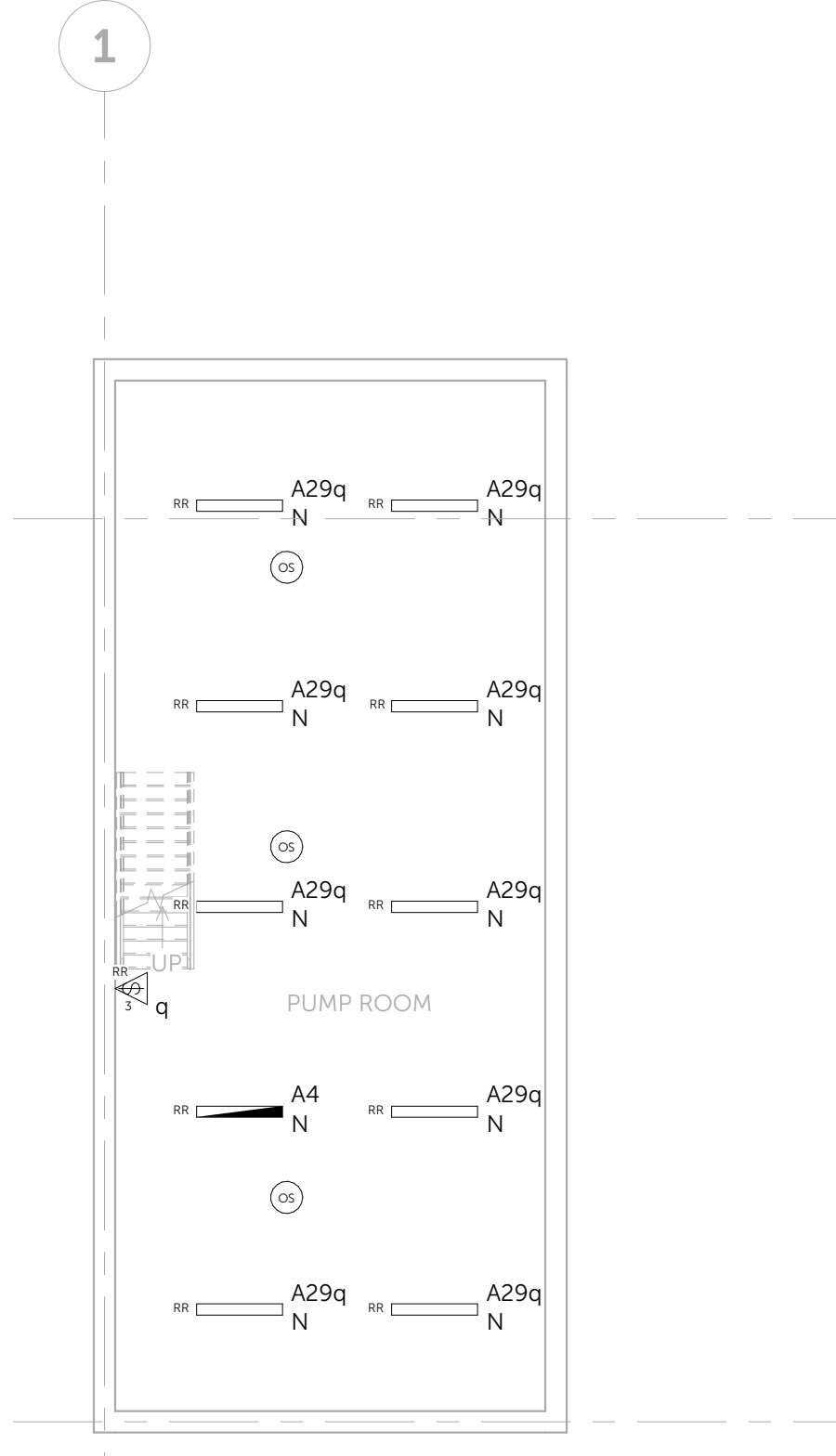
CHECKED BY: CS DRAWN BY: MJM
SCALE: As indicated DATE: 2025/02/24

DRAWING TITLE
FLOOR PLAN WEST

SHEET NO: **E-101** PROJECT NUMBER: **2411.013**
REVISION NO: **5**



3 MECHANICAL MEZZANINE
E-101 SCALE: 1:100

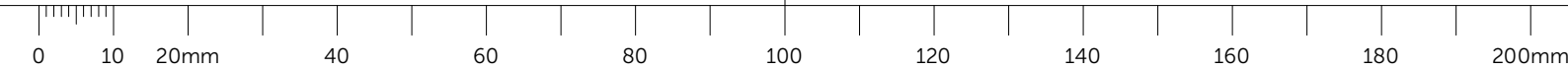


2 BASEMENT PUMP ROOM
E-101 SCALE: 1:100

1 GROUND FLOOR WEST
E-101 SCALE: 1:100

- KEY NOTES**
- CONTRACTOR TO REMOVE EXISTING NATATORIUM LINEAR FLUORESCENT LUMINAIRES. CONTRACTOR TO INSTALL NEW HIGH BAY LED LUMINAIRES PER LIGHTING SCHEDULE AND PLAN LAYOUT. LIGHTING SWITCHES AND LIGHTING RELAYS TO REMAIN.
 - CONTRACTOR TO USE EXISTING 120V BRANCH CIRCUITS. TO REUSE AND RETAIN ALL BRANCH WIRING AND JUNCTION BOXES. NOTE: PANEL AND WIRING SCHEDULE PRESENTED BASED ON AS BUILT RECORDS. CONTRACTOR TO VERIFY CIRCUIT SCHEDULE AND INFORM CONSULTANT OF ANY DISCREPANCIES.
 - CONTRACTOR TO REMOVE EXISTING NATATORIUM SUPPORT CABLES FROM ROOF ANCHORAGE. TO INSTALL STAINLESS STEEL AIRCRAFT CABLES AND SEISMIC RESTRAINT AS PER E-301. TO REUSE EYEBOLT ROOF ANCHORS.
 - CONTRACTOR TO REPLACE EXISTING TOGGLE SWITCHES WITH DIMMER SWITCHES, OCCUPANCY SWITCHES AND COLOUR TUNABLE DIMMER SWITCHES PER LIGHTING SCHEDULE. PULL ADDITIONAL CONTROL WIRE FROM SWITCH TO LIGHT AS NECESSARY. REFER TO PROJECT SPECIFICATIONS FOR MORE DETAILS ON LIGHTING CONTROL.
 - ALL LOW VOLTAGE POOL LIGHTING CONTROL TO REMAIN - INCLUDES NATATORIUM LIGHTS, SAUNA LIGHT, STEAM ROOM LIGHT AND STAIR 142 LIGHTS.
 - CONTRACTOR TO PROVIDE 120V OUTLET FOR LIGHTING CONTROL NETWORK ACCESS MODULE.

NOTE: FIELD VERIFY ALL MEASUREMENTS; DO NOT SCALE OFF DRAWINGS

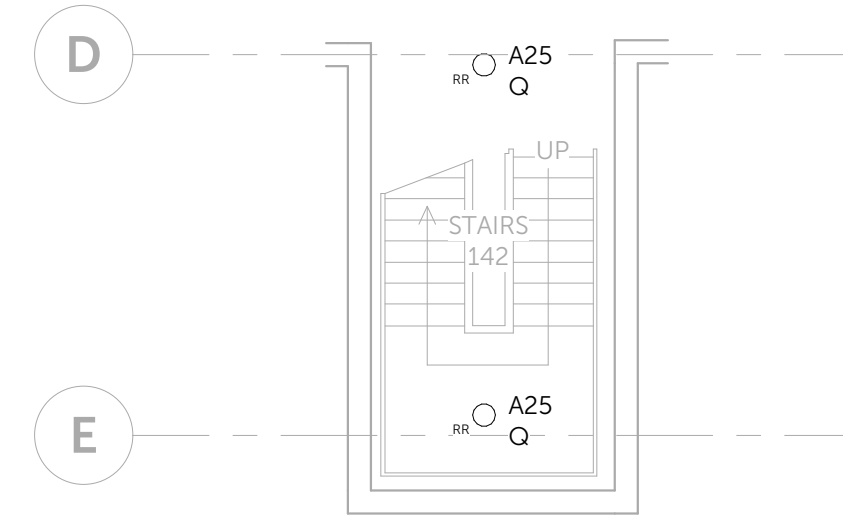




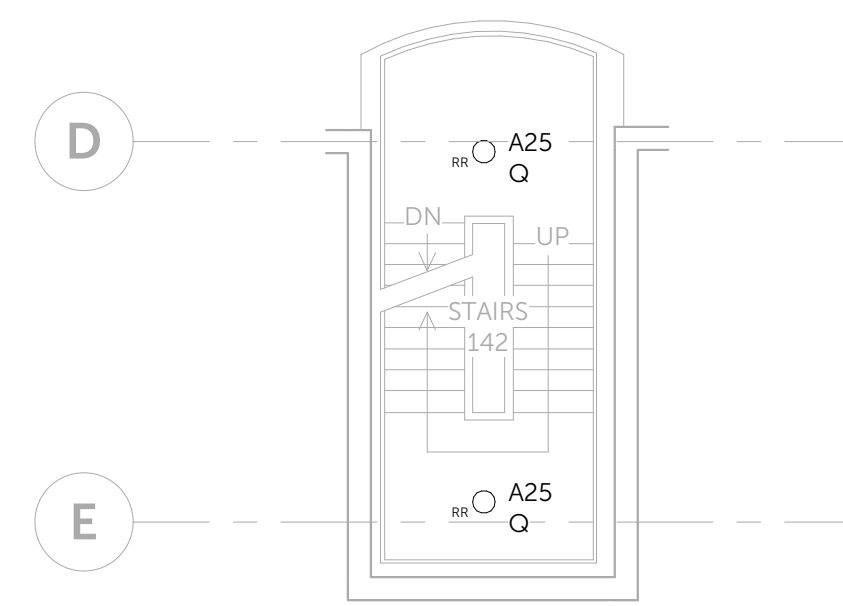
#200 - 3999 HENNING DRIVE, BURNABY, BC, V5C 6P9
PHONE: 604-255-0992 / FAX: 604-255-1054

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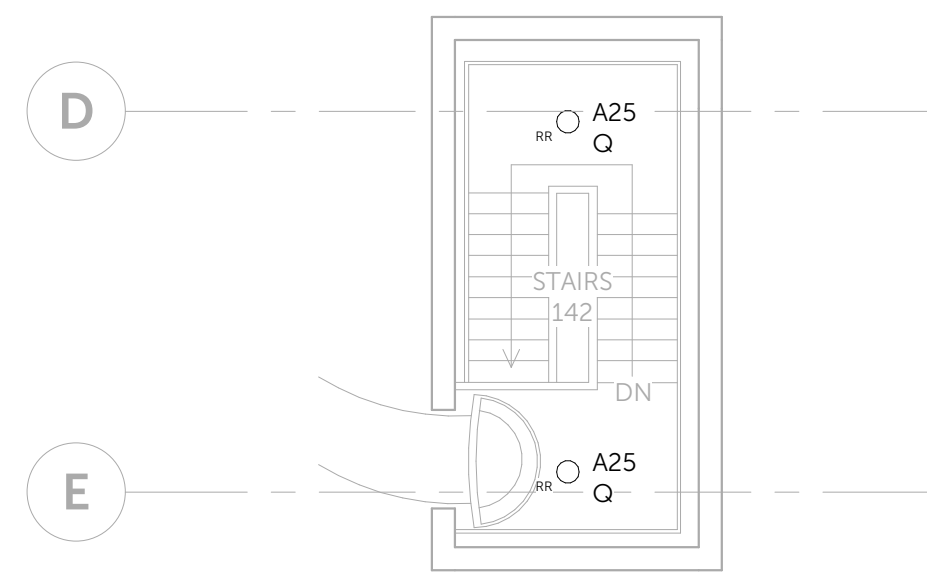
PERMIT TO PRACTICE NO. (BC): 1002633



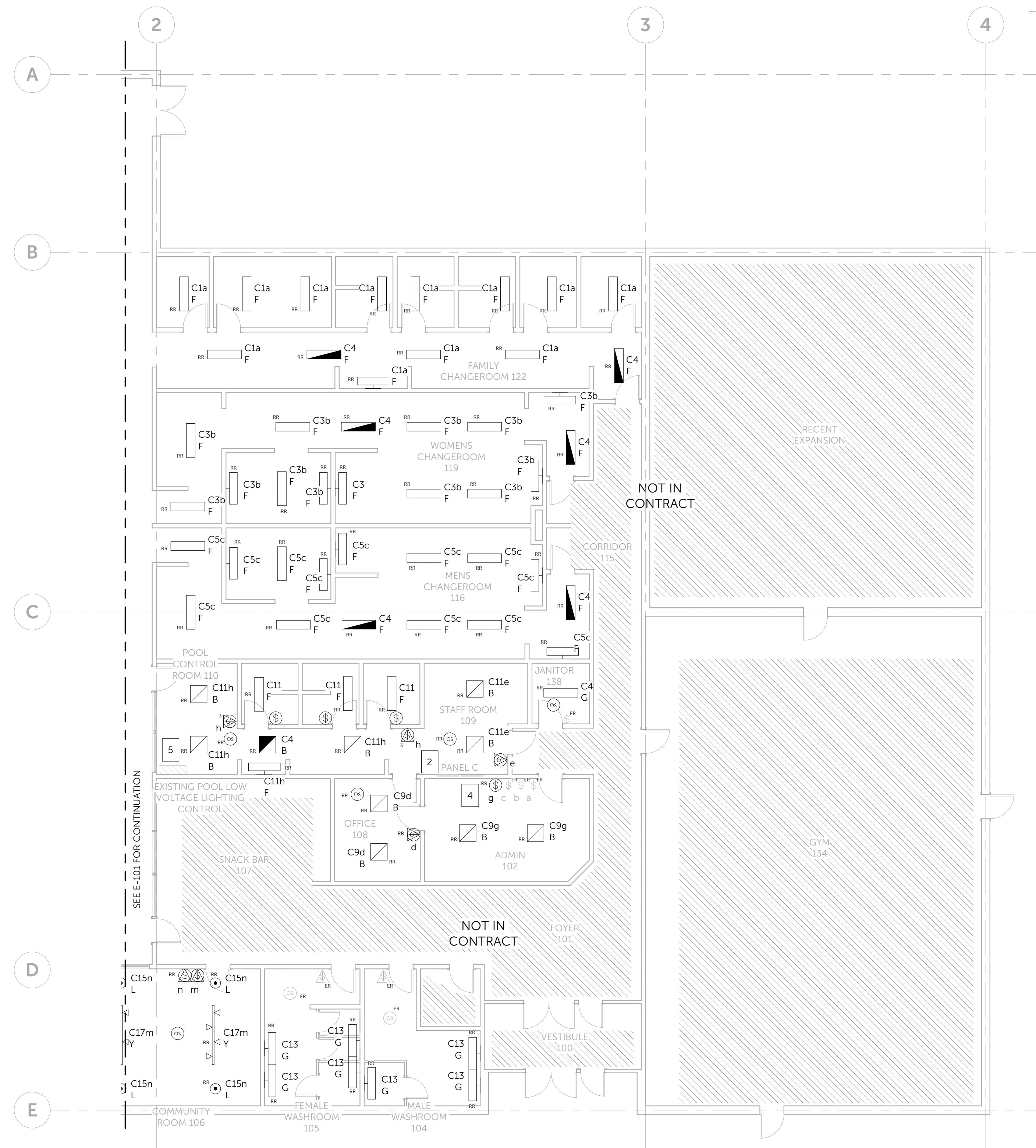
2 STAIR 142 - LANDING 1
E-102 SCALE: 1:100



3 STAIR 142 - LANDINGS 2 AND 3
E-102 SCALE: 1:100



4 STAIR 142 - LANDING 4 AND SLIDE LEVEL
E-102 SCALE: 1:100



1 GROUND FLOOR EAST
E-102 SCALE: 1:100

- KEY NOTES**
- CONTRACTOR TO REMOVE EXISTING NATATORIUM LINEAR FLUORESCENT LUMINAIRES. CONTRACTOR TO INSTALL NEW HIGH BAY LED LUMINAIRES PER LIGHTING SCHEDULE AND PLAN LAYOUT. LIGHTING SWITCHES AND LIGHTING RELAYS TO REMAIN.
 - CONTRACTOR TO USE EXISTING 120V BRANCH CIRCUITS. TO REUSE AND RETAIN ALL BRANCH WIRING AND JUNCTION BOXES. NOTE: PANEL AND WIRING SCHEDULE PRESENTED BASED ON AS BUILT RECORDS. CONTRACTOR TO VERIFY CIRCUIT SCHEDULE AND INFORM CONSULTANT OF ANY DISCREPANCIES.
 - CONTRACTOR TO REMOVE EXISTING NATATORIUM SUPPORT CABLES FROM ROOF ANCHORAGE. TO INSTALL STAINLESS STEEL AIRCRAFT CABLES AND SEISMIC RESTRAINT AS PER E-301. TO REUSE EYEBOLT ROOF ANCHORS.
 - CONTRACTOR TO REPLACE EXISTING TOGGLE SWITCHES WITH DIMMER SWITCHES, OCCUPANCY SWITCHES AND COLOUR TUNABLE DIMMER SWITCHES PER LIGHTING SCHEDULE. PULL ADDITIONAL CONTROL WIRE FROM SWITCH TO LIGHT AS NECESSARY. REFER TO PROJECT SPECIFICATIONS FOR MORE DETAILS ON LIGHTING CONTROL.
 - ALL LOW VOLTAGE POOL LIGHTING CONTROL TO REMAIN - INCLUDES NATATORIUM LIGHTS, SAUNA LIGHT, STEAM ROOM LIGHT AND STAIR 142 LIGHTS.
 - CONTRACTOR TO PROVIDE 120V OUTLET FOR LIGHTING CONTROL NETWORK ACCESS MODULE.

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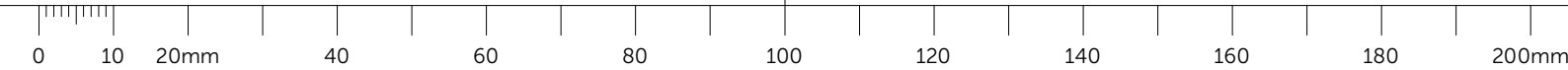
CLIENT
SUNSHINE COAST REGIONAL DISTRICT
1975 FIELD ROAD,
SECHLT, BC

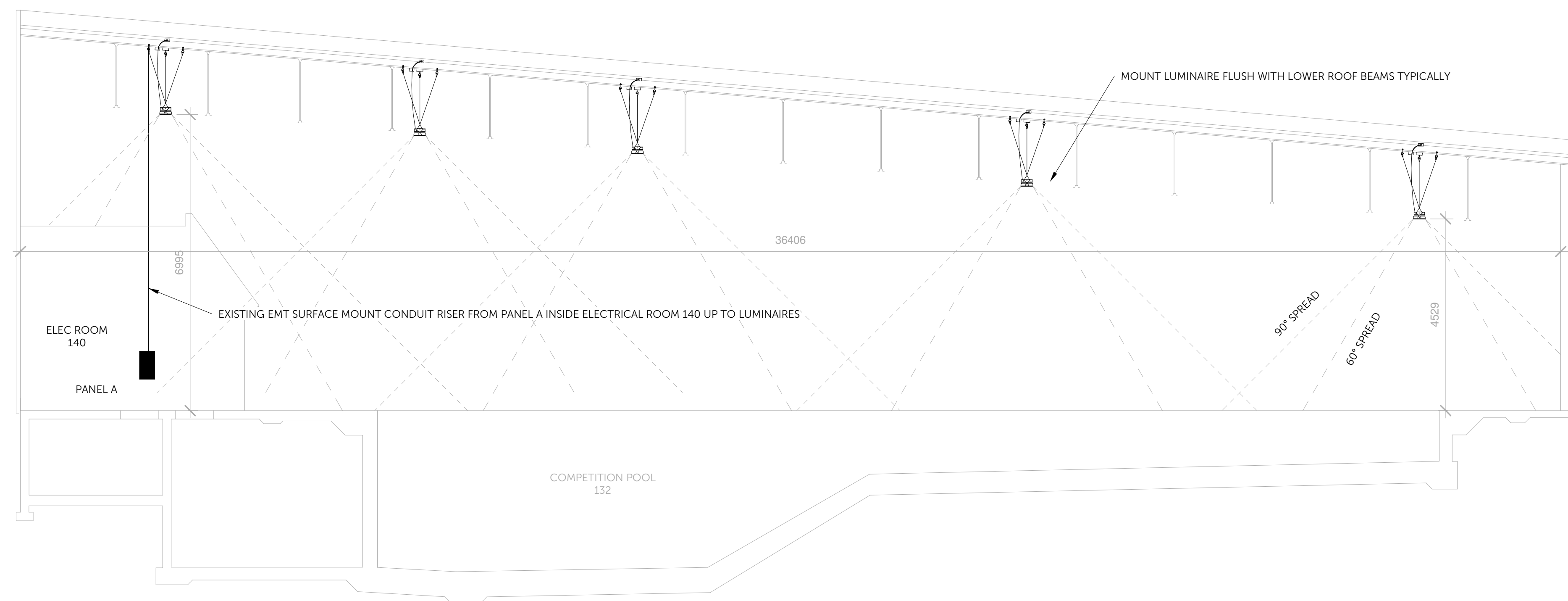
PROJECT TITLE
LIGHTING UPGRADE
SECHLT AQUATIC CENTRE
5500 SHORNLIFFE AVENUE, SECHLT, BC

CHECKED BY: CS DRAWN BY: MJM
SCALE: As indicated DATE: 2025/02/24

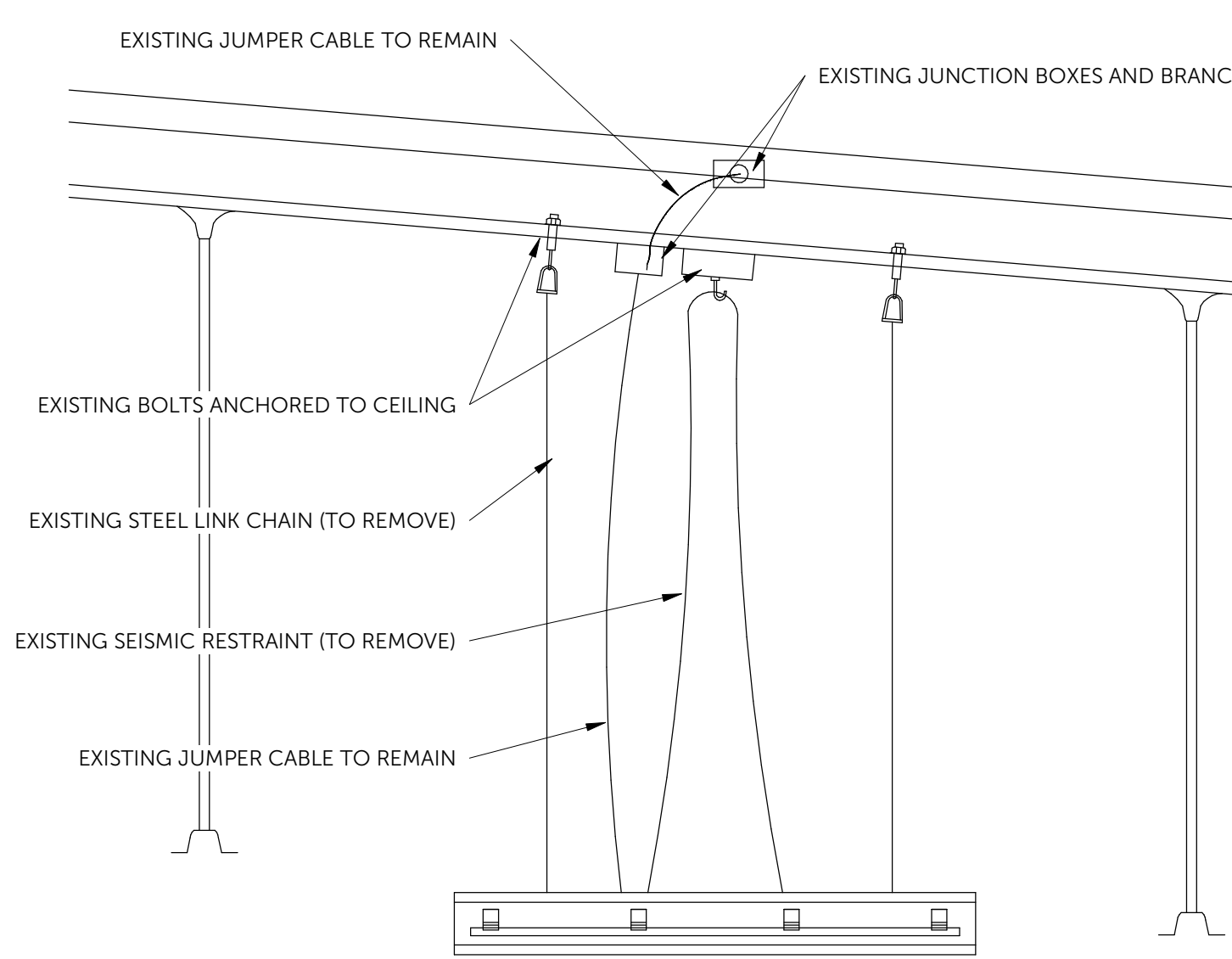
DRAWING TITLE
FLOOR PLAN EAST

SHEET NO: E-102 PROJECT NUMBER: 2411.013
REVISION NO: 5

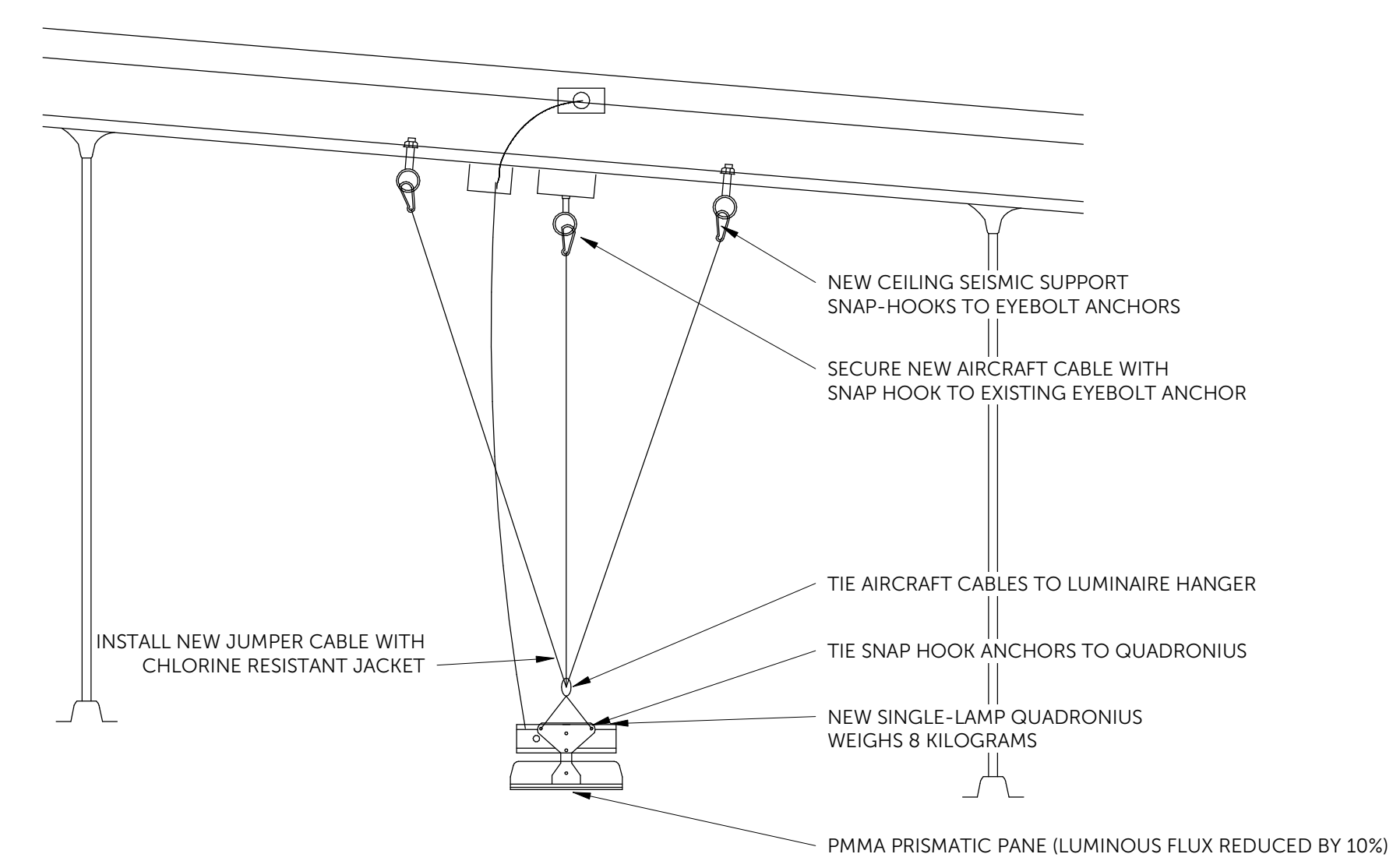




1 NATATORIUM ELEVATION
E-301 SCALE: N.T.S.



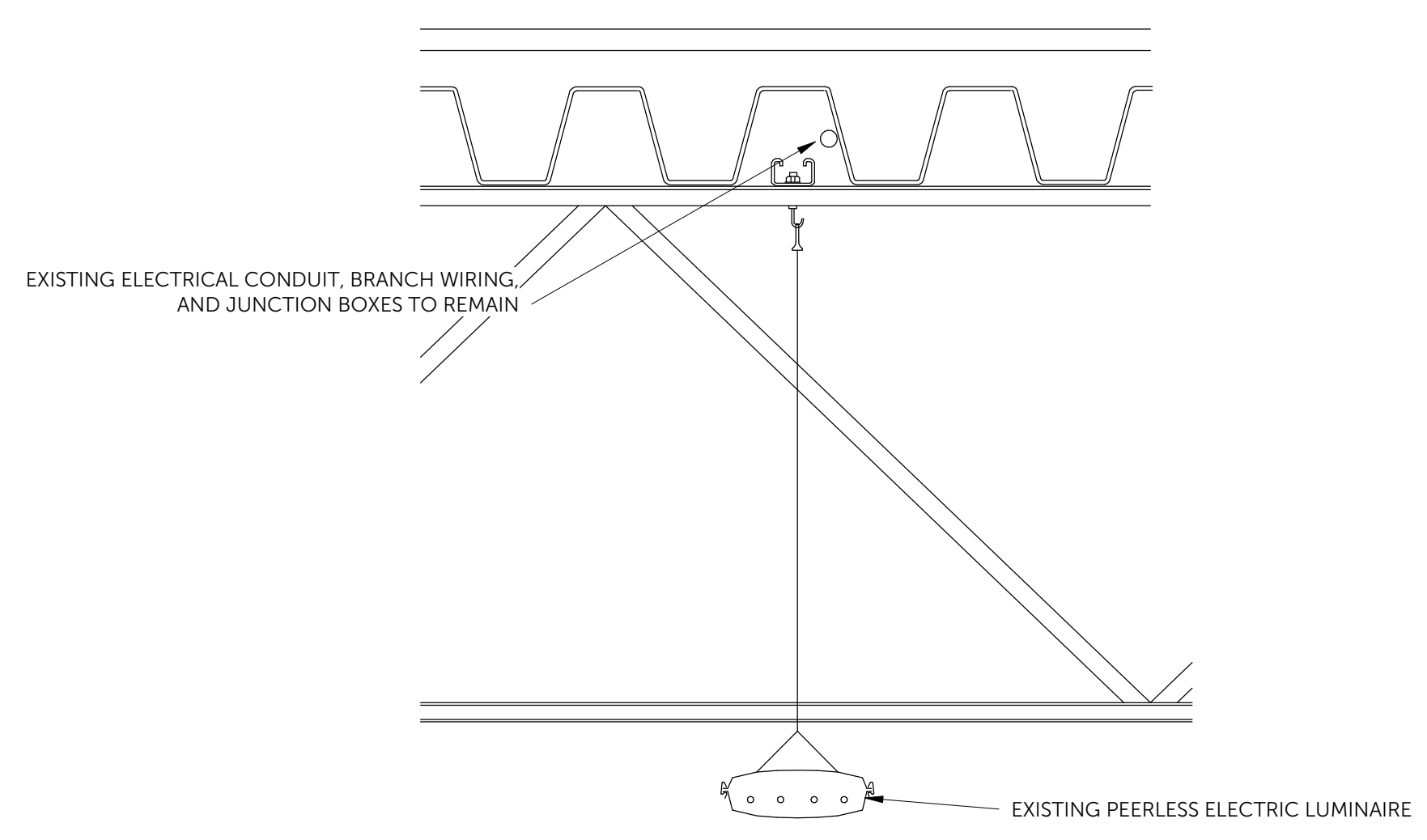
EXISTING PEERLESS ELECTRIC
AQUAPROTECT 4 FLUORESCENT LUMINAIRE
EXISTING
EAST - WEST CUTTHROUGH



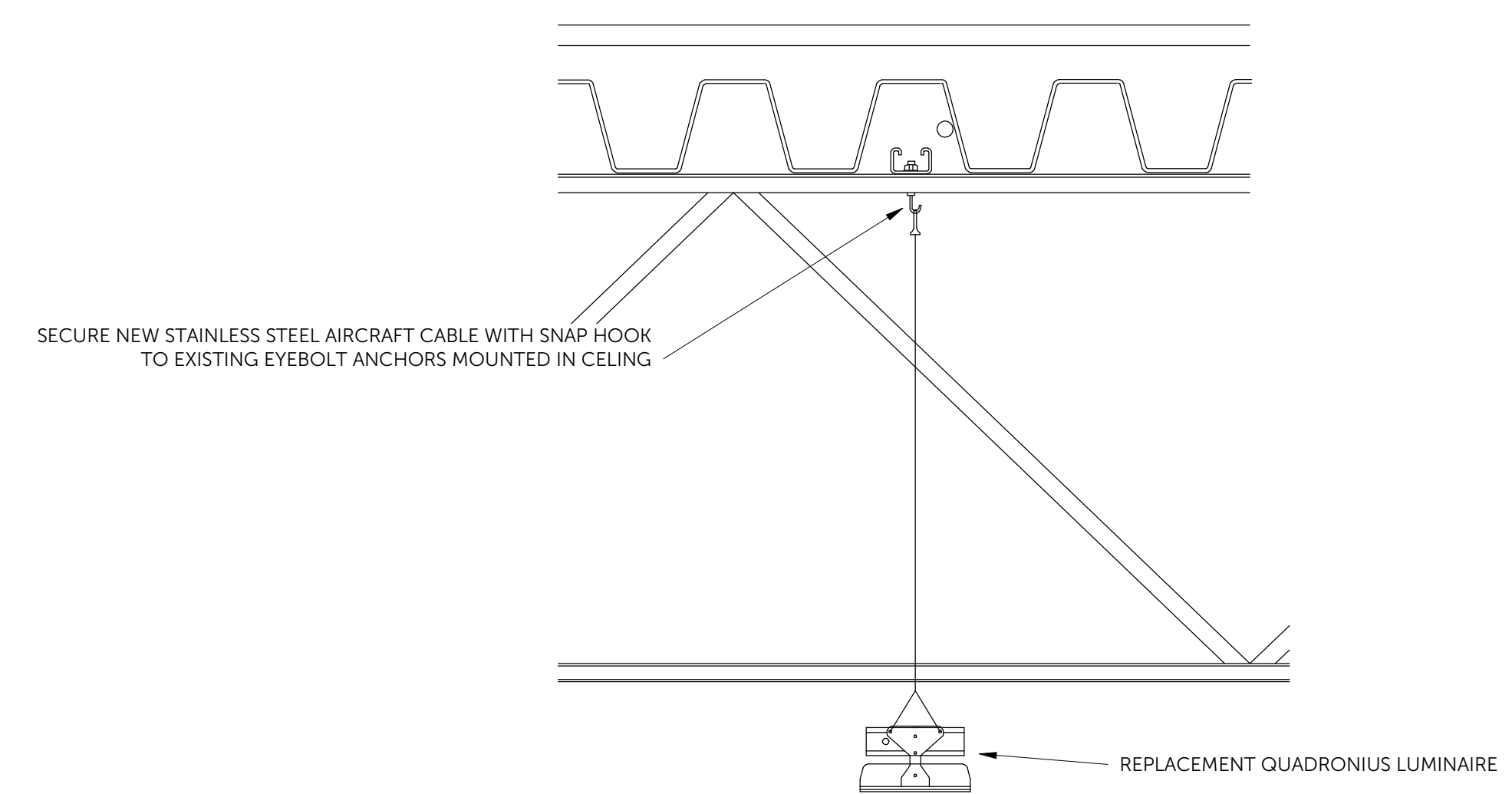
REPLACEMENT PRACTH
QUADRONIUS LED LUMINAIRE
PROPOSED
EAST - WEST CUTTHROUGH

- NOTES**
- AIRCRAFT CABLE TO BE UTILITY GRADE STAINLESS STEEL, 1/8", 4X19 STRAND CORE CONSTRUCTION
 - AIRCRAFT CABLE MINIMUM BREAKING STRENGTH = 1760LBS, WORK LOAD LIMIT = 300LBS
 - SECURE AIRCRAFT CABLES WITH STAINLESS STEEL CRIMPING SLEEVES
 - ALL CABLES AND ANCHORS TO BE STAINLESS STEEL UNLESS OTHERWISE NOTED

2 ANCHORAGE DETAIL
E-301 SCALE: N.T.S.



EXISTING
NORTH - SOUTH CUTTHROUGH



PROPOSED
NORTH - SOUTH CUTTHROUGH



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CLIENT
SUNSHINE COAST REGIONAL DISTRICT
1975 FIELD ROAD,
SECHLT, BC

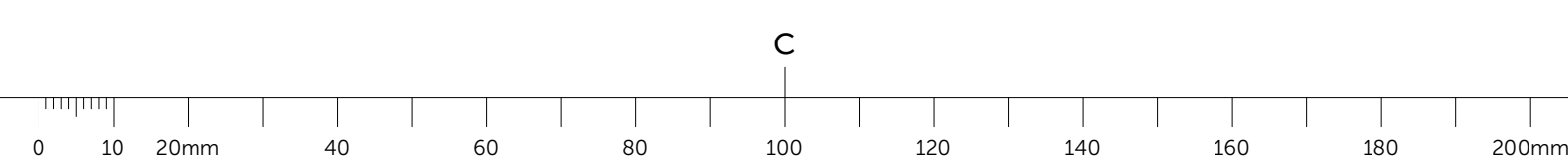
PROJECT TITLE
LIGHTING UPGRADE
SECHLT AQUATIC CENTRE
5500 SHORNCLIFFE AVENUE, SECHLT, BC

CHECKED BY CS	DRAWN BY MJM
SCALE As indicated	DATE 2025/03/05

DRAWING TITLE
NATATORIUM ELEVATION AND ANCHORAGE DETAILS

SHEET NO. E-301	PROJECT NUMBER 2411.013
	REVISION NO. 5

NOTE: FIELD VERIFY ALL MEASUREMENTS. DO NOT SCALE OFF DRAWINGS



LIGHTING DESIGN CRITERIA	
BUILDING TYPE	SPORTS AND RECREATION (INDOOR)
APPLICATION TASK	SWIMMING WITH FEW SPECTATORS
VIEWING SPECIFIC	WATER SURFACE
BEAM SPREAD	< 45° FROM NADIR - TO REMOVE DIRECT GLARE < 30° FROM NADIR - TO REDUCE WATER REFLECTANCE
COLOR TEMPERATURE	4000 KELVINS (COOL WHITE)
COLOR RENDERING INDEX (CRI)	80
INGRESS PROTECTION	IP66 - DUST TIGHT AND STRONG WATER JET TIGHT
ADDITIONAL PROTECTION	CHLORINE RESISTANT AND VAPOR TIGHT
ILLUMINANCE RECOMMENDATION	
LOWER LIMIT	200 LUX (18 FC) - PRIMARILY DECK AREAS AND PERIMETER
UPPER LIMIT	700 LUX (65 FC) - OVER COMPETITION POOL 500 LUX (45 FC) - OVER LEISURE AND WHIRL POOLS
UNIFORMITY	3:1

FOR POOL RATED LUMINAIRE WITH PRISMATIC PANES - LUMINOUS FLUX REDUCED BY 10% FROM STANDARD

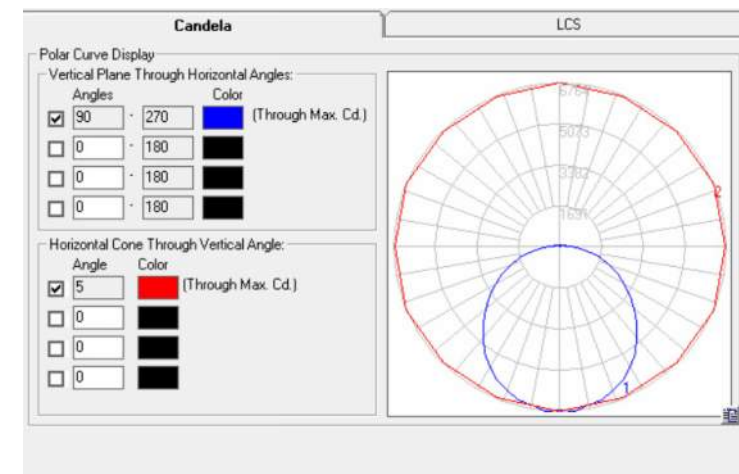
EXISTING LIGHTING SIMULATION IN NATATORIUM

- PEERLESS ELECTRIC AP4 WIDE 20,000 LUMENS
- ILLUMINANCE
AVERAGE = 77 FC, MAX = 99 FC, MIN = 34 FC, MAX/MIN = 2.92

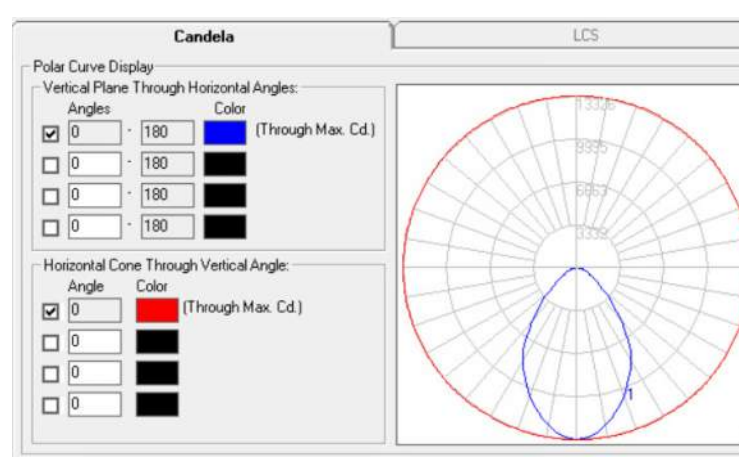
PROPOSED LIGHTING SIMULATION IN NATATORIUM

- REDESIGN EXISTING USING 60 AND 90 BEAM SPREADS AND 15,000LM AND 20,000 LUMEN HIGH BAY LUMINAIRES
- REMOVE 6 LUMINAIRES
- ILLUMINANCE
AVERAGE = 56 FC, MAX = 80 FC, MIN = 21 FC, MAX/MIN = 3.92

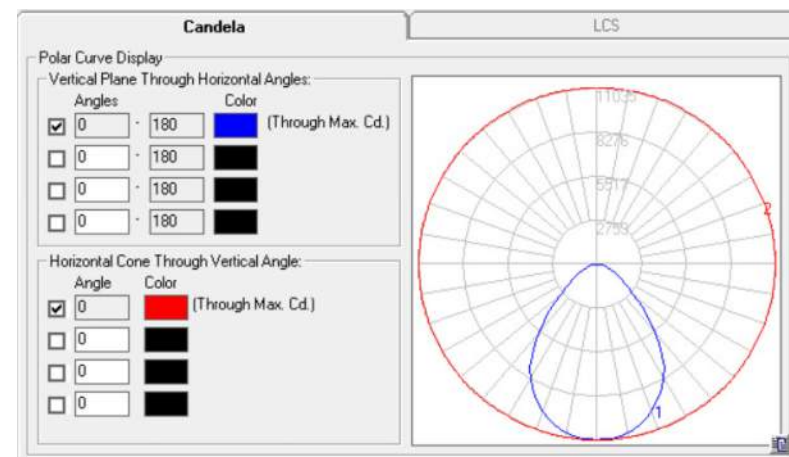
PEERLESS ELECTRIC AP4 POLAR PLOT



PRACHT QUADRONIUS 60° LAMP POLAR PLOT



PRACHT QUADRONIUS 90° LAMP POLAR PLOT



ISOLINE ILLUMINANCE COLOR LEGEND

Isolines For **ILLUMINANCE** Enabled

Isolines Properties
Line Width: 0.2 ft (0 = Pixel)

Label Isolines: Increment 1 ft Text Size 1 ft Include Units For Labels

Value	Color	Value	Color	Value	Color
100	Red	65	Blue	45	Green
90	Orange	60	Cyan	40	Yellow
80	Red-Orange	55	Light Blue	30	Yellow-Orange
70	Dark Red	50	Light Green		

Includes: Illum, Mesopic, Surround-Illum, Vert-Illum, Semi-Illum, and Hemi-Illum



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SUNSHINE COAST REGIONAL DISTRICT
1975 FIELD ROAD, SECHELT, BC

PROJECT TITLE
LIGHTING UPGRADE

SECHELT AQUATIC CENTRE
5500 SHORNCLIFFE AVENUE, SECHELT, BC

CHECKED BY: CS	DRAWN BY: MJM
SCALE: 1:1	DATE: 2025/03/05

DRAWING TITLE
NATATORIUM ILLUMINANCE SIMULATION

SHEET NO: E-501	PROJECT NUMBER: 2411.013
	REVISION NO: 5

1 ILLUMINANCE SIMULATION
E-501 SCALE: N.T.S.