



# UBCO CHILD CARE

University of British Columbia Okanagan  
Kelowna, BC

PRELIMINARY DEVELOPMENT APPLICATION  
22.07.25

PUBLIC ARCHITECTURE + COMMUNICATION  
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public UBC PROPERTIES TRUST

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# Written Description

## USE

The new UBCO childcare is an expansion to the existing University Children's Learning Centre at the UBC Okanagan campus. The new expansion will provide daycare spaces for 37 children from infant up to 5 years old in a one-story structure. The following design criteria were used to guide the design process

- The existing childcare centre has to remain operational during construction.
- Minimize the impact on the existing buildings, services, and natural environment.
- Allows for optimal program layout relationship including direct access between cubby and outdoor play areas.
- Create an experiential learning environment for children to explore, interact, and play.

## CONTEXT

The existing University Children's Learning Centre is located on the northwest side of the campus. It has close proximity to the campus student housing area.

On the site, there are three Service Right of Ways (SRW) running along the south, east and north edge of the lot. The existing childcare centre is a one-story structure located at the centre of the lot, with a parking lot situated on the east side of the building. Existing electrical, communication and gas services run beneath the parking lot and driveway.

In front of the existing childcare centre there are two mature deciduous trees that provide shade to the outdoor play space. In addition, on the north side of the site, is an existing stand of coniferous trees.

## PROGRAM

The program is based on BC Child Care Licensing Regulations, the City of Vancouver Childcare Guideline, Rick Hansen Accessibility guidebook and best practices from the UBC Childcare Services team.

There are three main zones in the program, indoor, outdoor, and entry. Indoor space subdivide into activity, support, and service spaces. Outdoor space includes active play zones and service.

## Written Description con't.

### RATIONALE

All indoor programs are located on the south side of the existing childcare building in a simple linear form. The existing fire department access road and part of the parking will remain unchanged.

In order to avoid interference with the existing childcare operations during the construction phase, the new addition is separate from the existing building. The outdoor play spaces act as a buffer zone in between, which also provide interaction opportunity between cohorts. In addition, this approach allows the majority of existing services to remain in place. The building is located to minimize the impact on the natural environment. This typology could potentially be applied to the north side of the site for a future childcare expansion.

The interior layout is simple and efficient. The main entry and vestibule are located in the centre of the plan. Access to the IT and 3-5 cohorts is directly from the entry lobby. The lobby also accesses support services such as mechanical, electrical/IT, waste management, staff and break rooms.

The primary structural system is exposed dimension lumber on a concrete slab on grade. Interior partitions are 7' high where the program permits to allow for a sense of connectivity. Cross bracing aligns with the top of partitions and creates a secondary scale to the space suitable for smaller occupants. Nap rooms are at the quiet east and west ends of the building away from activity areas.

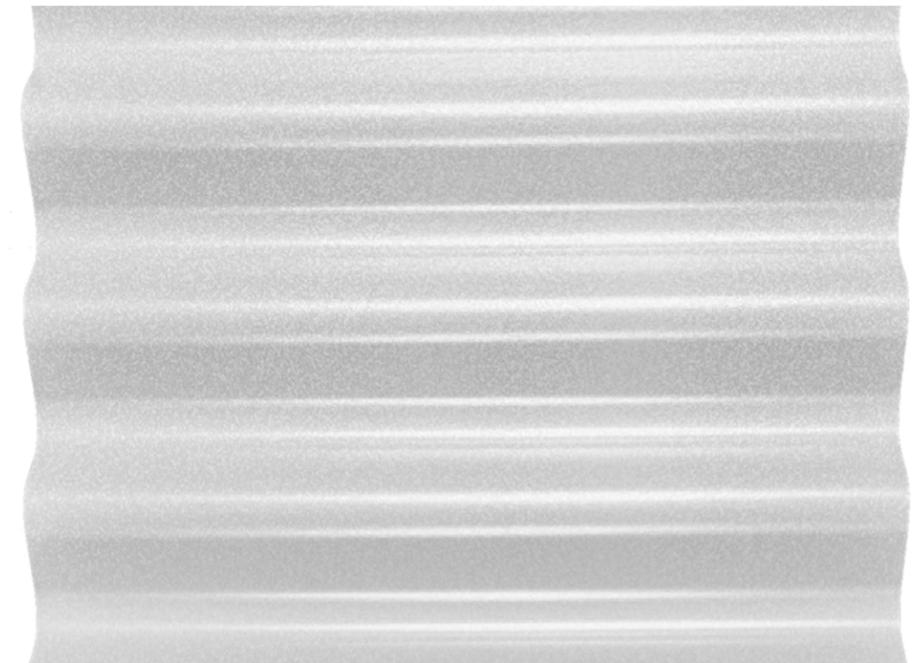
Both cohorts have a direct access to the exterior covered play areas and open air play areas.

### MATERIALITY

- Structure: Exposed dimension lumber.
- Foundation: Slab-on-grade.
- Envelope - walls + roof: Galvalume sinusoidal sheet metal cladding is proposed for fire resistance, a response to the hoops of the existing childcare, and for its integration with the translucent roof.
- Outdoor covered play area: Ocre swiss pearl.
- Translucent roof: Fibreglass sinusoidal roofing.



3-5 COHORT CUBBY SPACE AND ACTIVITY AREA



EXTERIOR FACADE CLADDING

# Design Policy Compliance

## UBCO - CLC Design Brief - Compliance Worksheet

2 URBAN DESIGN REQUIREMENTS	Associated Guideline Comment	Schematic Design Submission 100% Consulting Team Comment - Design Direction	responsibility
2.1 Building Design			
2.1.1 Site and Massing			
a The Child Care Facility building should contribute to and strengthen Discovery Way by addressing the street frontage and respecting setbacks established by adjacent buildings.			
b Minimize impact to the existing natural assets. Notably the wooded area to the north and west (see 2.3.1).		Sited to minimize natural asset impact.	PAC
c Create outdoor learning environments that allow students to engage safely with their natural surroundings.		Natural playspace design will be developed to engage the students, similar to new play elements completed 2 years ago.	CTQ-L
e Ensure highly functional indoor and outdoor program relationships (e.g., such as direct access between cubby and outdoor play areas).		Cubby has direct access to exterior.	PAC
f The Daycare Building and new facility should benefit from spaces framed by the buildings.			PAC
g Site the buildings to allow the existing Daycare Building to remain operational during construction of the new facility.		Existing DC is ~5m away from proposed bldg. Site access for construction can be separate from existing bldg entry	PAC
h Building height is subject to any restrictions required by Transport Canada and/or NAV Canada.		Proposed bldg height ~6m.	PAC
2.1.2 Architectural Expression			
a The architecture should work to express and creatively reveal the active uses within the facility, such as the vibrancy of active play and learning, without compromising child and staff comfort and safety.		Glazed north elevation reveals uses within facility.	PAC
2.1.3 Materials and Colours			
a Visual cohesion is an important principle for the campus and should be informed by a contextual analysis of adjacent buildings and landscape.		Context analysis of north / south neighbours req'd.	PAC
b Colour guidelines set out a basis from which a unified colour system can integrate and enhance the value of an individual project. See UBC Okanagan Design Guidelines, S.3 and S.5 for more details and guidelines.	<a href="https://campusplanning.ok.ubc.ca/wp-content/uploads/sites/64/2020/04/2019-01-10-UBCO-Design-Guidelines-R19-v4_FINAL-1.pdf">https://campusplanning.ok.ubc.ca/wp-content/uploads/sites/64/2020/04/2019-01-10-UBCO-Design-Guidelines-R19-v4_FINAL-1.pdf</a>	Galvalume cladding = UBCO Earth Primary Colour palette. Ocre Swiss Pearl = UBCO Ocre Primary Colour palette.	PAC
c Glazing as a primary treatment is not permitted. Clear or lightly tinted glazing should be used. No highly reflective or deeply tinted vision glazing is permitted.		Clear glazing will be used.	PAC
2.2 Public Realm and Landscape			
2.2.1 Design Principles	<a href="#">UBC Okanagan Whole Systems Infrastructure Plan (WSIP)</a>		
a Whole Systems thinking shall guide landscape design, consistent with the UBC Okanagan Whole Systems Infrastructure Plan (WSIP).		Noted - use of native plant material and stormwater swales will be utilized wherever possible.	CTQ-L
b The wooded area around the existing childcare centre is identified as having a High Environmental Sensitivity (ESA 2 rating). Prioritize preservation of existing Indigenous trees and plants onsite, and enhance and/or restore the site's natural ecology. Limit encroachment and minimize disruption to established natural landscape. Restore/replace impacted areas.		Noted - intent is not to encroach on this valuable area - existing fence line will not be adjusted.	CTQ-L
c Maintain the natural landscape buffer along west side of site to maintain the integrity of the Campus Pine Trail as a nature trail.		Noted - intent is not to encroach on this area.	CTQ-L
2.2.2 Plant Selection, Design and Biodiversity			
a Plant selection and landscape design shall be based on climate adaptability, drought tolerance, enhancement of biodiversity, reduction of invasive species, low maintenance requirements, and effectiveness in managing rainwater. Native and adapted plants are required to achieve these objectives and should provide a sense of a relationship with the woodland and grass landscapes that surround the campus. See UBC Okanagan Design Guidelines, S.2.3 for further guidelines.	<a href="https://campusplanning.ok.ubc.ca/wp-content">https://campusplanning.ok.ubc.ca/wp-content</a>	Noted - planting palette will be focussed on native plant material or locally adapted species with low maintenance and low water requirements ensuring a holistic integration with the existing landscaping on site and the surrounding native Ponderosa Pine vegetation.	CTQ-L
2.2.3 Lighting Design			
a A lighting design will ensure lighting levels are achieved around the building, while adhering to 'dark sky' principles. Lighting must create a safe environment for pedestrians and cyclists and contribute to providing a sense of place. See UBC Okanagan Design Guidelines, S.6 for further guidelines.		The lighting design will comply.	CIMA-E

# Design Policy Compliance con't.

<p><b>2.3 Access, Circulation and Signage</b></p> <p><b>2.3.1 Universal Accessibility</b></p> <p>a Main entrances must be clearly visible, well lit and located at grade to avoid the need for ramps.</p> <p>b Connections to the network of pedestrian paths should be well defined and universally accessible.</p> <p>c Accessible parking spaces for people with disabilities must be provided with the building and connected to the facility via accessible pedestrian paths. The number required must be consistent with City of Kelowna bylaw requirements. See UBC Okanagan Design Guidelines, S.2.5 for further guidelines.</p> <p><b>2.3.2 Parking and Access</b></p> <p>a Child care facilities require proximate short-term parking for pick-up/drop-off. Safe and convenient passenger loading and parking shall be provided for the existing and new childcare facilities on the site, consistent with the City of Kelowna bylaw requirements. The project should pursue appropriate strategies to retain on-site parking and/or work with UBC Parking Services to identify nearby, additional parking.</p> <p>b Required parking to serve the facilities must be connected to the buildings by paved and lighted pedestrian pathways, including parking provided in nearby locations (e.g., Discovery Avenue, Parking Lot W).</p> <p>c City of Kelowna fire and emergency access requirements must be addressed relative to any proposed site access revisions.</p> <p><b>2.3.3 Bike Parking and End-of-Trip Facilities</b></p> <p>a Sufficient bike parking to accommodate active transportation for building users and visitors is required. The number of spaces is to be determined in consultation with UBC Campus Planning and Transportation Engineer.</p> <p>b Bike racks are to be located in convenient and visible locations around the building, with a higher concentration near the main building entry.</p> <p>c Provision of end-of-trip facilities are needed to support sustainable transportation and commuting. Inclusion of appropriate shower and change facilities for building users should be pursued.</p> <p><b>2.3.4 Signage</b></p> <p>a Given the existing and new facilities will be separate buildings and will therefore require separate addressing and annunciator panels, upgraded building, emergency and wayfinding signage will be required for both buildings.</p>	<p><b>No ramps are proposed.</b> PAC</p> <p>Universal accessibility is key in day care centres and will be part of the design intent. CTQ-L</p> <p>This will be designed in collaboration with the Civil Engineers to ensure we meet the accessibility requirements and pedestrian circulation. CTQ-L/C</p> <p>Design in conjunction with the Civil team to ensure this is met. CTQ-L/C</p> <p>Design in conjunction with the Civil team to ensure this is met - CPTED guidelines to be used for this too. CTQ-L/C</p> <p>Design in conjunction with the Civil team to ensure this is met. CTQ-L/C</p> <p>Design in conjunction with the Civil team to ensure this is met. CTQ-L/C</p> <p>The design will ensure the required bike parking spaces are met and in positions of convenience and without impacting pedestrian circulation. CTQ-L</p> <p>PAC</p> <p>PAC</p>
<p><b>3 GREEN BUILDING REQUIREMENTS</b></p> <p>a UBC's sustainability policies require new buildings incorporate design strategies and energy systems toward the achievement of a 65% greenhouse gas reduction by 2030 and a 2050 net positive goal. Material selections should ensure a healthy environment is created for children using the facility.</p> <p>b The following strategies are recommended by UBC:</p> <p><b>3.1 Energy</b></p> <p>a Incorporate passive design principles (e.g., appropriate building massing, solar shading, glazing).</p> <p>b Avoid gas-fired equipment (including back-up).</p> <p>c Air source heat pumps (ASHP) should meet FortisBC cold climate ASHP rebate requirements.</p> <p>d The building should have a well-insulated envelope and comply with the prescriptive envelope requirements of National Energy Code of Canada for Buildings NECB-2020.</p> <p>e Airtightness testing is required.</p> <p>f Demand controlled ventilation and ventilation heat recovery are to be included.</p>	<p>No natural gas heating will be provided. The building heating and cooling system will rely on electrical heat pumps which offers the lowest level of greenhouse gas emissions inline with the 65% greenhouse gas reduction target. CIMA-M</p> <p>Proposed narrow west/east elevations without glazed openings. PAC</p> <p>No gas fired equipment proposed. CIMA-M Noted. CIMA-M</p> <p>Step code X of BCBC Energy Step Code. CIMA-M</p> <p>Noted. Airtightness per BCBC 10.2.3.5 will be included. CIMA-M Noted. CIMA-M</p>

# Design Policy Compliance con't.

<p>g Prioritize systems that are low maintenance.</p> <p>h Incorporate LED fixtures and natural lighting strategies and controls.</p>	<p>Centralized mechanical room proposed accessed at grade from outside childcare areas. Noted.</p>	<p>CIMA-M CIMA-E</p>
<p><b>3.2 Water</b></p> <p>a Stormwater management design shall comply with the UBC Okanagan Integrated Rainwater Management Plan (IRMP) and be developed in consultation with Campus Planning, Sustainability Operations and Facilities Management. The project is required to design a rainwater management plan to meet the IRMP's minimum on-site retention storage of 25mm for existing catchment areas. Maximize green spaces on site and use as rainwater gardens and/or LID swales.</p> <p>b</p> <p>c Ensure erosion control at southern site boundary.</p> <p>d Reduce outdoor water use and incorporate water-efficient landscaping.</p> <p>e Reduce indoor water use by using low flow fixtures to achieve minimum requirements.</p>	<p>CTQ WILL REQUIRE A PROPOSED SITE PLAN TO COMPLETE A PRELIMINARY DESIGN FOR STORMWATER.</p> <p>LID swales will be integrated if the geotechnical results allow for infiltration. CTQ WILL REQUIRE A PROPOSED SITE PLAN TO COORDINATE POSSIBLE RAINGARDENS WITH LANDSCAPE ARCHITECT.</p> <p>Noted CTQ WILL REQUIRE A PROPOSED SITE PLAN TO COORDINATE EROSION CONTROL MEASURES WITH LANDSCAPE ARCHITECT.</p> <p>This will be addressed with native and locally adapted plant material to reduce irrigation requirements. Noted</p>	<p>CTQ-C CTQ-L CTQ-C CTQ-L CTQ-C CIMA-M</p>
<p><b>3.3 Materials &amp; Resources</b></p> <p>a Incorporate use of low carbon materials.</p> <p>b Reduce construction waste and comply with UBCO green building waste requirements. <a href="https://sustain.ok.ubc.ca/sustcamp/operations/greenbuildings/diversion-reqs/">https://sustain.ok.ubc.ca/sustcamp/operations/greenbuildings/diversion-reqs/</a></p> <p>c Incorporate waste, recycling, refundables and composting facilities in the new Child Care Facility, consistent with UBC's waste and recycling guidelines. The location, size, and logistical access to this service space is to be determined in consultation with the Manager, Custodial and Waste Services.</p>	<p>Wood proposed throughout. Noted.</p> <p>Waste management area as per program. Confirm program reviewed by UBCO Custodial and Waste Services.</p>	<p>PAC SD PAC</p>
<p><b>3.5 Health &amp; Wellbeing</b></p> <p>a Source low emitting materials (low VOC &amp; phthalate free).</p> <p>b Provide access to fresh air and natural and/or comfortable interior light.</p>	<p>Noted. Noted.</p>	<p>PAC PAC</p>
<p><b>3.6 Quality</b></p> <p>a Consult the UBC Technical Guidelines as applicable to the Okanagan campus early in the design process to understand and design for operational requirements. <a href="https://www.technicalguidelines.ubc.ca/">https://www.technicalguidelines.ubc.ca/</a></p> <p>b Incorporate use of durable materials.</p>	<p>Tech Guidelines differ from Daycare requirements for door hardware, plumbing fixtures, IT/AV. Noted.</p>	<p>PAC PAC</p>
<p><b>3.7 Climate Adaptation</b></p> <p>a Plan for mechanical systems that can maintain thermal comfort for predicted warming climate.</p>	<p>Energy modelling required for BP. Modeller TBD. EM to incorporate 2050 Climate data and provide design temperature target.</p>	<p>TBD</p>
<p><b>4 FUNCTIONAL PROGRAM</b></p> <p><b>Overview</b></p> <p>A Functional Program for the Child Care Facility has been developed, lead by UBCO Business Operations with the assistance of Public Architecture + Communications, and in consultation with the UCLCS, child care staff and parents. The program is based on BC Child Care Licensing Regulation, the City of Vancouver Childcare Guideline, Rick Hansen Accessibility guidebook and best practices from the UBC Childcare Services team. The program is comprised of indoor spaces, including activity areas, support areas and services areas, and outdoor spaces, including covered and uncovered play areas and storage.</p> <p><b>Optimize the Functional Program</b></p>		

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<p><i>Optimization throughout the design process will be required:</i></p> <p>a Consult with the UBC working committee to develop an efficient, right-sized, functional layout and design that minimizes unusable, redundant and over-built areas.</p> <p>b Track the design space allocations and building efficiency relative to the functional program.</p> <p>c Ensure the design complies with BC Child Care Licensing Regulation.</p> <p>d Work with Facilities Planning to ensure the design meets UBC space allocation practices and functional requirements.</p> <p>e "Future proof" the building to reduce the need for extensive renovation for future technical upgrades.</p> <p><i>Additional information and the detailed program breakdown is provided in Appendix B.</i></p>	<p>Proposed reductions have been made to circulation. PAC</p> <p>Noted. PAC</p> <p>Noted. PAC</p> <p>Noted. PAC</p> <p>Exposed systems proposed. PAC</p>
<p><b>5 EXISTING UTILITIES</b></p> <p>Existing services are located in proximity to the site in the adjacent utility corridor on Discovery Avenue, with the exception of District Energy, which is not presently accessible to the site. No major connection issues have been identified pending confirmation of capacities by the Project Team.</p> <p>There are several underground services running through the site that may require relocation and consolidation to accommodate the new development. There are water, sanitary sewer, gas, electrical and communications lines that extend from Discovery Avenue to the existing Daycare building in several locations. Additionally, the sanitary sewer line for the Plant Growth Facility (PGF) runs along the southern edge of the subject site.</p> <p>There is an existing Statutory Right of Way (SRW) for electrical service that runs adjacent to the site on Discovery Avenue, and another along the site's southern boundary, which extends gas and electrical service to the PGF.</p> <p>The following overview is intended to provide a snapshot of available services and their locations based on current understanding. As UBC does not possess as-built drawings, further investigation by the Project Team in consultation with Campus Planning and selected UBC staff specialists will be required to determine appropriate course of action for building site services.</p> <p><b>5.1 Water</b></p> <p>a Water service to the Child Care Facility is anticipated to connect from an extension of the existing water main on Discovery Avenue. An existing hydrant is located south of the site on Discovery Avenue, immediately north of the Upper Campus Health driveway access. Water modelling during the detailed design phase should be completed to confirm capacity.</p> <p><b>5.2 Stormwater</b></p> <p>a The existing Daycare building is connected to the campus's stormwater management system along the northern boundary of the site, however the existing parking lot on site drains to two dry wells. See Design Brief S.3.2 Green Building Requirements – Water, for stormwater management requirements for the site.</p> <p><b>5.3 Sanitary Sewer</b></p> <p>a The existing sanitary line for the Daycare building runs diagonally to the southeast corner of the site. Additionally the sanitary line for the PGF runs along the southern boundary of the site. Relocation of one or both of these lines may be required as part of this project and planning shall be completed in consultation with Campus Planning and Facilities Management. It is anticipated that connection will be provided to the Child Care Facility from the existing sanitary main on Discovery Avenue. Modelling will be required to determine capacity.</p> <p><b>5.4 Electrical</b></p>	<p>CTQ WILL REQUIRE A PROPOSED SITE PLAN TO START COORDINATION OF PROPOSED SERVICES WITH THE CONSULTANT TEAM. CTQ-C</p> <p>CTQ WILL REQUIRE A PROPOSED SITE PLAN TO START COORDINATION OF PROPOSED WATER SERVICING WITH MECHANICAL. LOCATION OF EXISTING HYDRANT MAY BE TOO FAR FROM BUILDING SEIEMESES CONNECTION WHICH MAY REQUIRE A NEW ONSITE HYDRANT TO BE INSTALLED. WATER MODELLING WILL NOT BE DONE BY CTQ.....WE CAN COMPLETE A DEMAND CALCULATION IF REQUIRED. CTQ-C</p> <p>CTQ WILL REQUIRE A PROPOSED SITE PLAN TO COMPLETE A PRELIMINARY DESIGN FOR STORMWATER. IT IS SUGGESTED THAT EXISTING PARKING LOT / DRIVEWAY DRAINAGE CONTINUE TO BE MANAGED BY EXISTING DRYWELLS. CTQ-C</p> <p>CTQ WILL REQUIRE A PROPOSED SITE PLAN TO START COORDINATION OF PROPOSED SERVICES WITH THE CONSULTANT TEAM. SANITARY MODELLING WILL NOT BE DONE BY CTQ.....WE CAN COMPLETE A DEMAND CALCULATION IF REQUIRED. CTQ-C</p>

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<p>a Electrical service connection is anticipated from the existing underground electrical line on Discovery Avenue. Discussions between Project Team (in consultation with Campus Planning and Facilities Management) and FortisBC Electric will be required to determine cost as well as formal permissions/ agreement. With the recent Daycare building renovation, the electrical load is understood to be at full capacity and the subject project could require an upgrade to the existing transformer. In the event that an expanded and or additional transformer is needed, an SRW will be required, necessitating prior approvals by the university's Board of Governors and Ministry of Advanced Education, Skills and Development prior to registration. The Project Team is to notify and consult with Campus Planning on advancing any required SRWs and approvals.</p>	<p>The existing transformer size that feeds the existing daycare is rated for 75kVA. The preliminary load calculation sizes the new daycare building at approximately 90kVA. PLEASE ENSURE PROPOSED SITE PLAN SHOWS LOCATION OF PROPOSED NEW TRANSFORMER AS THIS WILL IMPACT PROPOSED SITE GRADING AND SITE SERVICING.</p>	<p>CIMA-E/CTQ-C</p>
<p><b>5.5 IT/ Communications</b></p> <p>a UBC requires buildings to install redundant communication connections for academic and research buildings to prevent disruption to communication services. For the Child Care Facility, single fibre optic connection will be required for the new facility. Based on updated UBC IT standards, copper communications will not be required. It is anticipated that the Child Care Facility will be serviced via fibre optic connection from the existing junction box on Discovery Avenue and routed through conduit to the building. Alternative routes may be considered in consultation with the university's IT department. Twenty-four strand fibre will be required to service both network and fire system connections.</p> <p>b Third party service providers have been used in the existing Daycare facility (e.g., Telus for phone service). Consultation with third party providers, specifically Shaw and Telus, would be prudent to ensure viable pathway is identified. This may be serviced from the existing Daycare facility. Third parties are not permitted to occupy ducts belonging to UBC, which are reserved for exclusive university use.</p>		<p>CIMA-E</p> <p>CIMA-E</p>
<p><b>6 PROCESS, PERMITS AND APPROVALS</b></p>		
<p><b>6.1 Project Team Process</b></p>		
<p>a The project is subject to the Major Capital Projects Development Process (Projects \$2.5 - \$5 Million), which involves a number of steps, approvals and key stakeholders. The project design team will be accountable to and report to the UBC Property Trust (UBCPT) Project Manager. The Project Manager in turn will report to and be accountable to the UBC Okanagan Child Care Facility Steering Committee. The design team will also be guided by input and feedback from a stakeholder Working Group chaired by the Project Manager.</p> <p>b For more details, see the Major Capital Projects Development Process (Projects \$2.5 - \$ 5 Million)</p>	<p><a href="https://infrastructuredevelopment.ubc.ca/wp-content/uploads/2021/12/UBC-Major-Capital-Projects-Development-Process_2.5-5M.pdf">https://infrastructuredevelopment.ubc.ca/wp-content/uploads/2021/12/UBC-Major-Capital-Projects-Development-Process_2.5-5M.pdf</a></p>	
<p><b>6.2 Development Approval Application Process</b></p>		
<p>a Through the university's development application process the project will be reviewed by UBC Staff to ensure the best interests of the university and its stewardship mandate are fully addressed. UBC's Office of Campus Planning oversees and coordinates the development approval process. UBC will manage all public consultations and the selected design team will be asked to provide materials and participate as required.</p> <p>b For more details, see the Development Application Process for Major Capital Projects (\$2.5 - \$5M) in Appendix C.</p>		<p>PAC</p>
<p><b>6.3 UBC Sustainability Process</b></p>		
<p>The project sustainability consultant is to coordinate the design team in an integrative process and partner with the UBC Properties Trust to:</p>		<p>PAC</p>
<p>a Deliver an integrated project that recognizes synergies across disciplines and systems.</p>	<p>Noted.</p>	<p>PAC</p>
<p>b Incorporate effective outcomes in terms of life-cycle costs.</p>	<p>Noted.</p>	<p>PAC</p>

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c Host two sustainability workshops to achieve integrated design and optimize opportunities for sustainable solutions:  
Workshop 1 takes place during schematic design and provides early focus on building massing, orientation, sustainable energy, and water systems.  
Workshop 2 takes place later in design development to review and refine sustainability strategies.

## 6.4 City of Kelowna

UBC Okanagan is located within the City of Kelowna, and as such, development within the campus is subject to the City's bylaws, permits and approval processes. The main campus is zoned CD-20 – Comprehensive University Development. The subject site also falls within the City's Natural Environment and Wildfire Development Permit (DP) Areas.

## 6.5 Transport Canada and NAV Canada

Transport Canada and NAV Canada each have an approvals process for buildings located near airports. UBC Okanagan is located within the Kelowna International Airport's Outer Surface and subject to the Kelowna Airport Zoning Regulations and the approval processes for Transport Canada and NAV Canada.

PAC

Workshop 1 July 12.

PAC

Workshop 2 early August.

PAC

PAC

# Tree Survey and Arborist Report

**From:** Robert Major <robert@majorpm.ca>  
**Sent:** Thursday, July 21, 2022 2:13 PM  
**To:** Andrea Kopecka  
**Cc:** Brian Wakelin; Katie R. Simpson  
**Subject:** Fwd: UBCO - CLC - Trees  
**Attachments:** InkedDaycare trees.jpg; UBCO\_Daycare\_Expansion\_MEMO.pdf

Hello Andrea,  
The information about the trees that we have received from CP and the Services folks.

Regards,  
Robert.

----- Forwarded message -----

**From:** Riley, Abigail <[abigail.riley@ubc.ca](mailto:abigail.riley@ubc.ca)>  
**Date:** Wed, Jul 20, 2022 at 8:12 PM  
**Subject:** RE: UBCO - CLC - Trees  
**To:** Robert Major <[robert@majorpm.ca](mailto:robert@majorpm.ca)>  
**Cc:** Ziebart, Kristin <[kristin.ziebart@ubc.ca](mailto:kristin.ziebart@ubc.ca)>, Bilodeau, Leanne <[Leanne.Bilodeau@ubc.ca](mailto:Leanne.Bilodeau@ubc.ca)>, Lussier, Renée <[renee.lussier@ubc.ca](mailto:renee.lussier@ubc.ca)>, Pagliocchini, Kayla <[kayla.pagliocchini@ubc.ca](mailto:kayla.pagliocchini@ubc.ca)>

Hi Robert,

Kristin Ziebart, UBCO's Landscape and Building Services Manager, has condition files for many of the trees around the daycare, however those to the north/west have not been captured. Attached is a snip from the condition report with the most valuable cultivated trees circled by Kristin based on their condition, type and maturity. The coding indicates: green dot – good condition; yellow dot – fair; and red dot – poor.

In regards to the existing indigenous Ponderosa trees to the north/west, we would also reference the 2019 environmental assessment commissioned from Ecoscape Environmental to assess their value and any proposed interventions for this area.

Thanks, Abbie

**Abigail Riley** MUP, RPP, MCIP ([She, Her, Hers](#))  
Associate Director | Campus Planning  
UBC | Okanagan Campus | Syilx Okanagan Nation Territory  
Phone 250 807 9647 | Cell 250 317 0135 | [abigail.riley@ubc.ca](mailto:abigail.riley@ubc.ca)



# Geotechnical Report

January 20, 2020

Ecora File No.: 191064

Mr. Ted Sandstra, Architect, AIBC, PMP, LEED AP  
Project Services – The University of British Columbia  
ADM 006 1138 Alumni Ave  
Kelowna, BC V1X 3X8

**Reference: Geotechnical Assessment – UBCO Daycare Upgrades, Kelowna, BC**

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## 1. Introduction

Ecora Engineering & Resource Group Ltd. (Ecora) was retained by The University of British Columbia (The Owner) to undertake a geotechnical assessment in support of expansion to the existing campus daycare facility located at 1262 Discovery Ave, Kelowna, BC. Ecora understands that the proposed expansion will comprise the demolition of two covered deck areas to be rebuilt and enclosed to increase the interior space by approximately 186 m<sup>2</sup> (2000 ft<sup>2</sup>).

The purpose of the geotechnical assessment was to evaluate the suitability of the site for the proposed expansion and identify the presence and extent of any geotechnical constraints associated with this project. This report summarizes our observations and provides geotechnical recommendations with respect to the design and construction of the proposed additions.

Ecora understands that Part 9 of the 2018 British Columbia Building Code (BCBC) is expected to govern the design of the proposed additions.

## 2. Site Description

The existing daycare facility, located at 1262 Discovery Ave is within the University of British Columbia Okanagan Campus, which is legally described as Lot A, Plan KAP87188, Section 10 & 11, Township 23, Osoyoos Division of Yale District. The daycare facility is located within the western portion of the campus and is bordered by agricultural land to the west, the Upper Campus Health Building to the south, campus residences buildings to the north and Discovery Ave to the east.

The facility is situated on a generally flat building platform that lies approximately 3 m above the Health Building to the south at an approximate slope of 3H:1V. The area to the north steps up to the campus residences approximately 3 m in terraced slopes not exceeding 2H:1V.

A site plan indicating the location of the subject property is presented in Figure 1.0.

## 3. Geology

### 3.1 Surficial Geology

Referenced to Geological Survey of Canada Map “Surficial Geology of Kelowna” (Paradis, 2009)<sup>1</sup> indicates that the site is underlain by a continuous gravelly sandy till cover.

### 3.2 Bedrock Geology

Referenced to Geological Survey of Canada Map “Geology, Okanagan Watershed British Columbia” Geological Survey of Canada, Open File 6839, scale 1:100 000” (Okulitch 2013)<sup>2</sup> indicates that the site is underlain by White Lake Formation Breccia, rhyolite; pyroclastic rocks; lahars; minor lava, trachyte and andesite.

Bedrock is anticipated to be at a significant depth beneath the anticipated construction elevations.

## 4. Field Investigation

Ecora conducted a geotechnical investigation of the site on December 19, 2018 comprising advancement of three test pits (TP19-01 to TP19-03) within the subject property using a John Deere 50 Mini Excavator. The field investigation was supervised by Ecora geotechnical personnel who maintained a continuous log of the encountered soil and groundwater conditions and collected representative soil samples for visual classification and lab analysis.

The locations of the test pits are shown on the attached Figure 1.0. The detailed test pit logs are presented in Appendix B.

## 5. Encountered Site Conditions

### 5.1 Soil Conditions

The following soil types were encountered within the depth zone investigated by the test pits in the following sequence:

- **Topsoil / Granular Fill** was encountered in all two of the three test pits (TP19-01 and TP19-03) to a maximum depth of approximately 0.30 m below existing site grades. The topsoil was described as a sandy silt, trace gravel, containing some roots, moist and dark black in in color. TP19-02 surficial material comprised of granular fill consisting of 9.5 mm poorly graded gravel, grey to brown in colour, underlain by;
- **Glaciofluvial Deposits** comprising sand with varying silt and gravel contents was observed in all three test pits to a maximum depth of 1.8 m below existing site grades. The glaciofluvial deposits were

<sup>1</sup> Paradis, S.J. (2009). “Surficial Geology, Kelowna, British Columbia,” Geological Survey of Canada, Open File 6146

<sup>2</sup> Okulitch, A.V. (2013). “Geology, Okanagan Watershed, British Columbia,” Geological Survey of Canada, Open File 6839

observed to be loose to compact in consistency, dry to wet, and brown in color, which in turn was underlain by;

- **Glaciolacustrine Deposits** comprising silty clay, trace sand, medium to high plasticity, moist, and grey in color. The glaciolacustrine deposits were stiff to hard in consistency and were found to the maximum depth investigated of 2.4 mbgl.

Detailed Test Pit logs are presented in Appendix B following the text of this report.

## 5.2 Groundwater

Groundwater was not observed during the field investigation. However, it is noteworthy that groundwater elevations can be seasonally effected and an elevated water table may be encountered.

## 5.3 Laboratory Testing

Laboratory testing was conducted in Ecora’s CCIL certified lab on a selected soil sample to confirm the field observations and their physical characteristics. Results are summarized in Table 5.3.1 and Table 5.3.2 below and detailed results are provided in Appendix C attached.

**Table 5.3.1: Moisture Content & Gradation Testing Results**

Borehole No.	Sample Depth (m)	Moisture Content (%)	Grain Size (%)			Atterberg Limits (%)		
			Gravel	Sand	Fines (Silt/Clay)	Liquid Limit	Plastic Limit	Plasticity Index
TP19-02	0.5	9.4	1.8	73.1	25.1	-	-	-
TP19-02	1.8	27.0	-	-	-	75	28	47
TP19-03	0.8	4.3	15.2	71	13.8	-	-	-

Laboratory testing results are presented in Appendix C following the text of this report.

# 6. Discussions and Recommendations

## 6.1 General

Based on Ecora’s understanding of the project we are of the opinion that, from a geotechnical perspective, the site is suited for the proposed development provided that our recommendations are followed during design and construction.

Ecora shall be given a chance to review any design drawings prior to construction to confirm that our recommendations have been followed and provide updated recommendations, if required.

If subsurface conditions are found to differ from those anticipated during construction, Ecora shall be contacted to provide updated geotechnical recommendations that reflect the existing site conditions.

## 6.2 Site Preparation

The footprint area of any proposed structure shall be thoroughly cleared of all topsoil, vegetation, debris or any undocumented fill or other deleterious matter to expose competent native soils.

The stripped subgrade shall be moisture conditioned as required, compacted, and reviewed and approved by the geotechnical engineer prior to concrete form placement. The review of the subgrade shall include a “proof-roll” by completing several passes with a vibratory roller or an approved alternative. Any cobbles and boulders present at the subgrade elevation should be removed to allow for uniform compaction of the subgrade soils. Any soft areas or areas showing poor performance (i.e. pumping, cracking, deflection etc.) should be sub-excavated and replaced with suitable structural fill as per Section 6.3 below.

## 6.3 Structural Fill

Upon subgrade approval from the geotechnical engineer, structural fill may be placed (if required) and shall be moisture conditioned and placed in horizontal lifts typically not exceeding 300 mm in loose thickness and uniformly compacted to a minimum 95% Modified Proctor Maximum Dry Density (MPMDD) (ASTM D1557). Structural fill shall consist of an approved well graded, free draining (free from excess fines, organics and deleterious matter) material with a maximum particle size of 150 mm. All structural fill is subject to approval by a geotechnical engineer prior to placement and compaction.

## 6.4 Re-Use of On-Site Material

Excavated on-site materials may be used as general trench backfill for utility installation provided it is free of organics, any deleterious material and that the required compaction can be achieved. Based on the soils encountered during the field investigation, the on-site native alluvial gravelly sand deposits found within the test pits may be considered suitable for use as general trench backfill. The on site materials are not suitable for use as structural fill due to the high fines content.

The suitability of any imported material or existing material proposed for use as structural fill should be reviewed during construction and confirmed by a geotechnical engineer prior to its use onsite.

## 6.5 Frost Protection

Frost susceptibility of soils refers to the propensity of the soil to grow ice lenses and heave during freeze and thaw cycles. According to National Research of Canada (Canada Building Digest 182) the frost penetration depth for the region where the proposed site is located is estimated (from normal freezing index) at 0.6 m below ground surface. Therefore, the underside of footings and utilities should be placed at least 0.6 m below the final site grade to conform to the frost protection requirement.

Where the underside of footing cannot be designed at the minimum depth (0.6 m below site grade) thermal insulation shall be incorporated according to design guidelines such as ASCE 32-01 (published by American Society of Civil Engineers) into the foundation design.

## 6.6 Bearing Capacity

Shallow foundations placed directly on approved prepared subgrade or structural fill as discussed in Section 6.2 and 6.3, in general accordance with Part 9 of BCBC 2018, shall be designed for an allowable bearing pressure of 75 kPa.

Structures that fall under Part 4 of the BCBC 2018 may require a detailed geotechnical investigation and/or additional design.

## 6.7 Slab-on-Grade Floors

Interior slab-on-grade should be supported on a minimum 100 mm thick layer of under-slab fill consisting of 19 mm minus crushed gravel, overlying approved native subgrade material, or structural fill prepared in accordance with the recommendations in this report. The under-slab fill shall be moisture conditioned and compacted to a minimum 100% SPMDD.

Slab-on-grade floors shall be designed in accordance with Section 9.13 of BCBC 2018 with regards to damp proofing, waterproofing and soil gas control.

## 6.8 Foundation Drainage

Ecora recommends that a conventional perimeter drainage system be installed along the exterior building foundations. The perimeter drainage system should be constructed with rigid perforated PVC piping with a minimum diameter of 100 mm covered with not less than 150 mm of crushed stone or other coarse clean granular material containing not more than 10% of material passing a 4 mm sieve. The invert of the perimeter drain pipes should be located at least 300 mm below the top of the floor slab.

## 6.9 Site Storm Disposal and Storm Water Management

Sidewalks, paved or landscaped areas within a zone of approximately 2 m of the exterior perimeter of the proposed dwelling should be sloped to drain away from the structure at a minimum grade of 2%. Site grading should be designed in such a manner as to prevent the ponding of surface water near foundation walls and paved areas.

Drainage considerations established during design and construction should be maintained for the life of the development. Altering drainage patterns can be detrimental to the performance of structures, retaining walls, and roadway foundations.

Based on the soil types noted in the testpit investigation, foundation perimeter and roof downspouts may be accommodated by infiltration pits. If infiltration pits are used for stormwater disposal, the actual size and suitable locations of the pits shall be determined by a qualified design engineer. Ecora can provide this service upon request. Infiltration pits should be located downslope of any proposed structure and a minimum 5 m away from building foundations.

Based on the granular soils encountered during the site investigation, a saturated hydraulic conductivity of  $1 \times 10^{-6}$  m/s may be utilized for design of infiltration pits. The estimated hydraulic conductivity based on grain size distribution is presented on the attached Figure 2.0.

## 6.10 Temporary Excavation and Utility Trenching

Temporary excavation work should be carried out in accordance with requirements specified by the WorkSafe BC Occupational Health & Safety Regulations, Part 20. Soil sloughing, development of tension cracks atop the excavation, groundwater seepage or loose/soft soil conditions encountered during excavation may require flatter excavation slopes than those specified in the WorkSafe BC Occupational Health & Safety Regulations, Part 20. A Qualified Professional Geotechnical Engineer shall review all proposed temporary excavation works during construction, when required by WorkSafe BC.

Excavated material from trenches should either be removed from the site or placed a minimum distance away from the excavation, equal to the depth of the excavation. Where buildings or other structures are near

the excavation, additional review of the proposed excavation work should be undertaken by Qualified Professional Geotechnical Engineer.

All utilities should be bedded as per the City of Kelowna development by-laws. General trench backfill above the bedding should be placed in loose lifts not exceeding 300 mm thickness, and each lift should be compacted to a minimum of 95% of Modified Proctor Maximum Dry Density (MPMDD).

## 6.11 Permanent Slopes

Permanent cut and fill slopes in the native soils and/or structural fill shall not be graded steeper than 2H:1V. Permanent fill slopes shall be over-built and then trimmed back to the recommended inclination.

Permanent cut and fill slopes shall be vegetated immediately after construction to prevent surface erosion. Vegetation growing on slopes assists in stabilization by root-binding, preventing erosion and lowering soil moisture content. The establishment of additional vegetation comprising of native grasses and perennial mix with pocket planted shrubs is recommended. Large trees should be kept well away from shallow surface foundations to prevent root interaction effects.

## 6.12 Retaining Walls

Should it not be possible to achieve the above site grading requirements, construction of permanent retaining walls may be required. Retaining walls shall comply with the City of Kelowna bylaws, with all walls over 1.2 m in height to be designed by a professional engineer. All tiered slopes consisting of two or more retaining walls less than 1.2 m in height shall be designed as an engineered slope where averaged grading exceeds the above recommended grading requirements. An assessment of global stability shall be undertaken in the design of all engineered retaining walls and/or slope.

Any retaining walls at or below a 1H:1V line projected from the outside leading edge of a foundation supporting a structure is considered to be a structural element as specified in Appendix A-9.3.2.9(4) of the BCBC 2018 and therefore shall be designed by a professional engineer. Retaining walls above the 1H:1V projected line may be considered a structural element. A typical drawing showing this requirement is presented in Figure 3.0.

# 7. Review and Construction Inspections

Ecora should be given the opportunity to review details of the design and construction specifications related to all geotechnical aspects of this project prior to construction. Past experience has shown that this action may prevent inconsistencies that may lead to disputes.

All foundation design recommendations presented in this report are based on the assumption that an adequate level of monitoring will be provided during construction, and that construction will be carried out by a suitably qualified contractor, experienced in foundation and earthworks construction. An adequate level of monitoring is considered to be:

- For shallow foundations, observation of all bearing surfaces prior to placement of structural fill and prior to concrete placement; and
- For earthworks, full-time monitoring and compaction testing.

Suitably qualified persons, independent of the contractor, should carry out all such monitoring. It shall be noted that failure to provide an adequate level of construction inspections and monitoring may result in contravention of the Building Code.

## 8. Limitations of Report

This report and its contents are intended for the sole use of The University of British Columbia, their agents and the applicable regulatory authorities. Ecora Engineering & Resource Group Ltd. (Ecora) does not accept any responsibility for the accuracy of any data, analyses, or recommendations contained or referenced in the report when the report is used or relied upon by any Party other than The University of British Columbia, their agents, the applicable regulatory authorities or for any Project other than that described in this report. Any such unauthorized use of this report is at the sole risk of the user.

Where Ecora submits both electronic file and hard copy versions of reports, drawings and other project-related documents, only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Ecora shall be deemed to be the original for the Project. Both electronic file and hard copy versions of Ecora's deliverables shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Ecora.

Ecora's General Conditions are provided in Appendix A of this report.

## 9. Closure

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Sincerely

**Ecora Engineering & Resource Group Ltd.**

**Prepared By:**



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**Version Control and Revision History**

Version	Date	Prepared By	Reviewed By	Notes/Revisions
0	2020-01-20	CF	ML	Issued For Use

Attachments:	Figure 1.0	Site Plan
	Figure 2.0	Saturated Hydraulic Conductivity Estimation Based on Gradation
	Figure 3.0	Influence Zone of Retaining Walls
	Appendix A	General Conditions
	Appendix B	Test Pit Logs
	Appendix C	Lab Analysis Results

# Figures

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- Figure 1.0 Site Plan
- Figure 2.0 Saturated Hydraulic Conductivity Estimation Based on Gradation
- Figure 3.0 Influence Zone of Retaining Walls

# SITE PLAN



## GEOTECHNICAL ASSESSMENT UBC OKANAGAN CAMPUS SYILX NATION TERRITORY KELOWNA, BC

### Legend

- Test Pit Locations
- City of Kelowna Roads
- City of Kelowna 1m Contours
- City of Kelowna Legal Parcels

### LOCATION MAP

Project Location

Bear Creek Park

Rose Valley Lake

Okanagan Lake

Kelowna

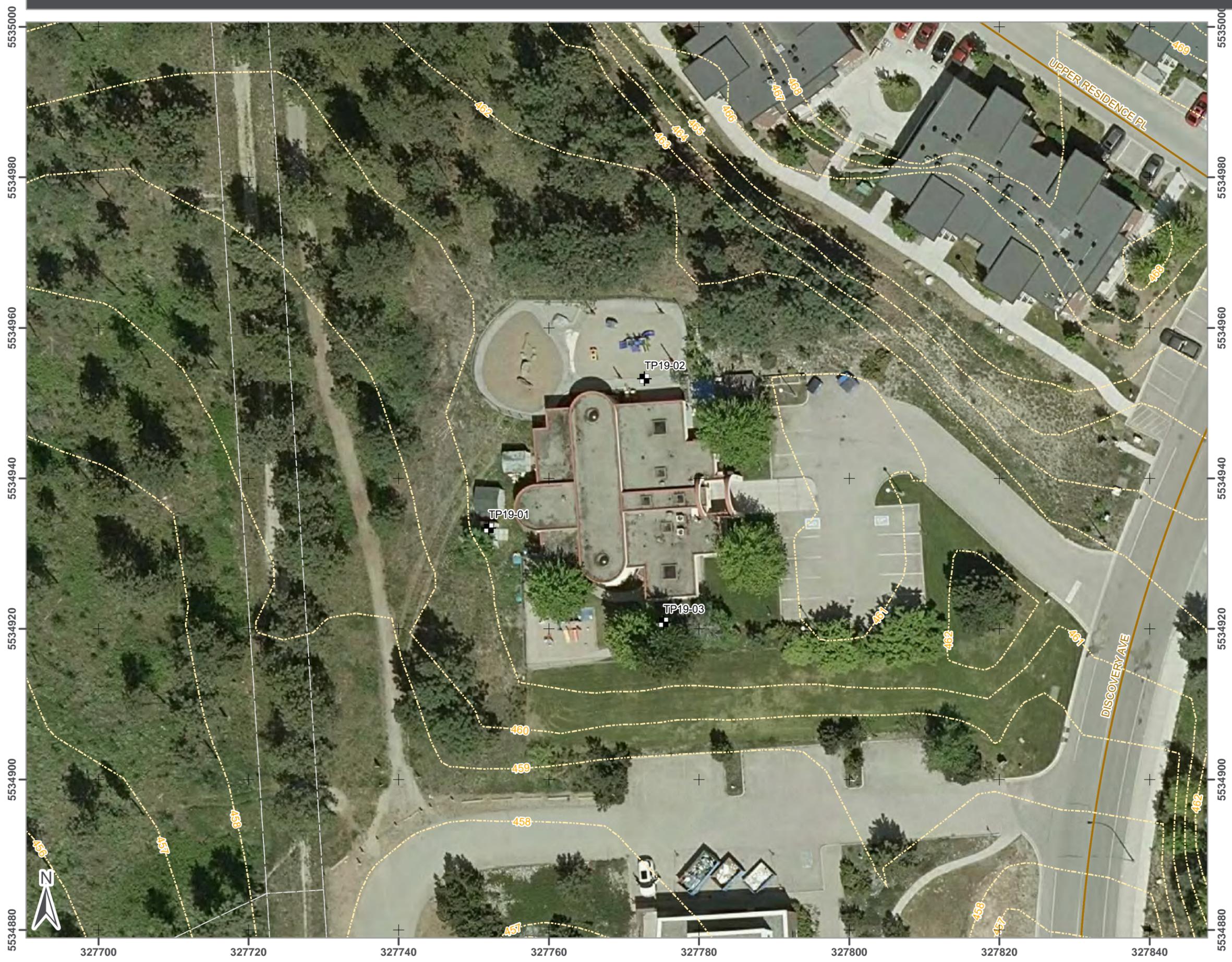
Myra-Bellevue Park

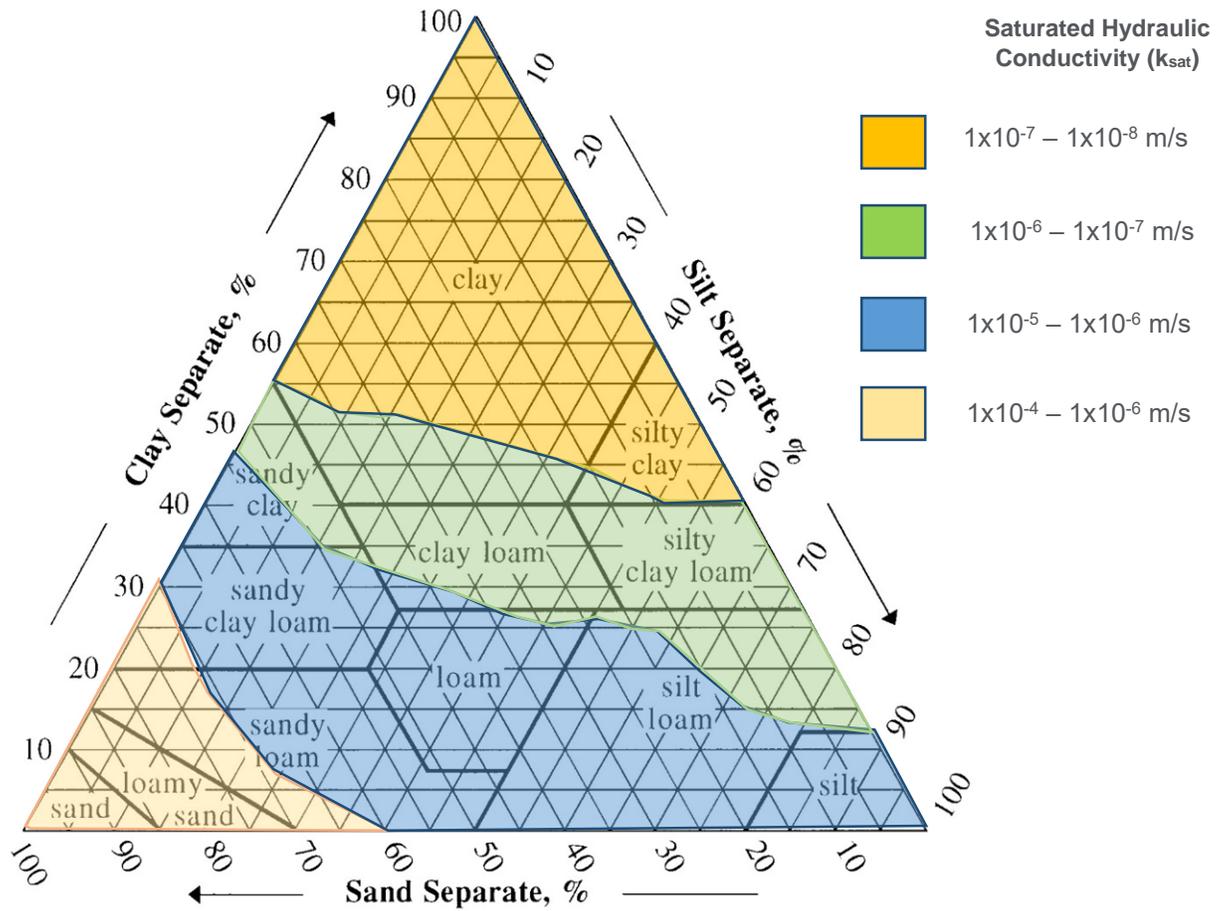
1:500

Meters

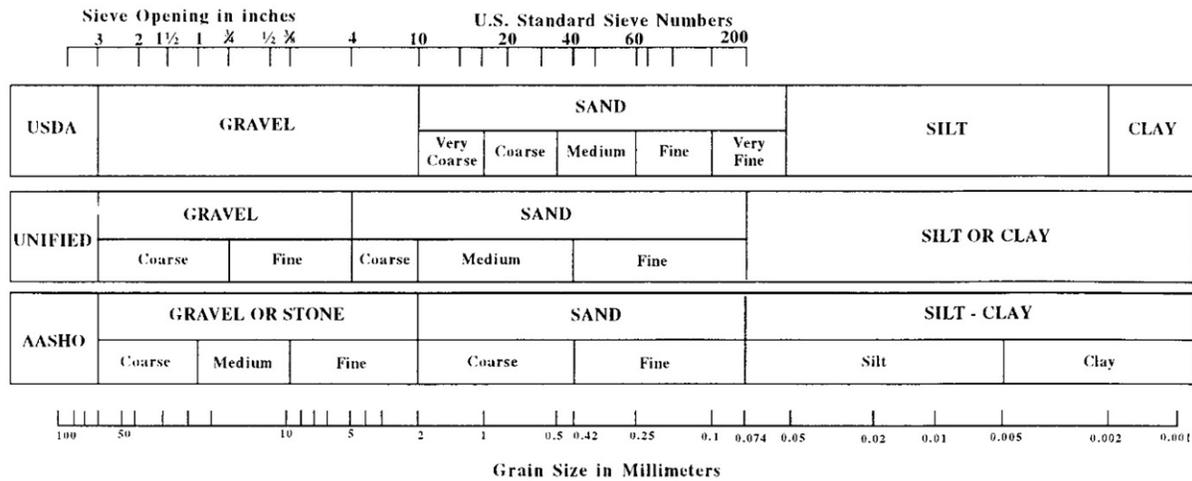
Project No.: 191064 Date: 2020/01/10  
Client: The University of British Columbia | Okanagan Campus Drawn: MT Check:  
NAD 1983 UTM Zone 11N

Figure 1.0





**COMPARISON OF PARTICLE SIZE SCALES**



**Notes:**

U.S. Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. Available online. Accessed [August 31, 2015].

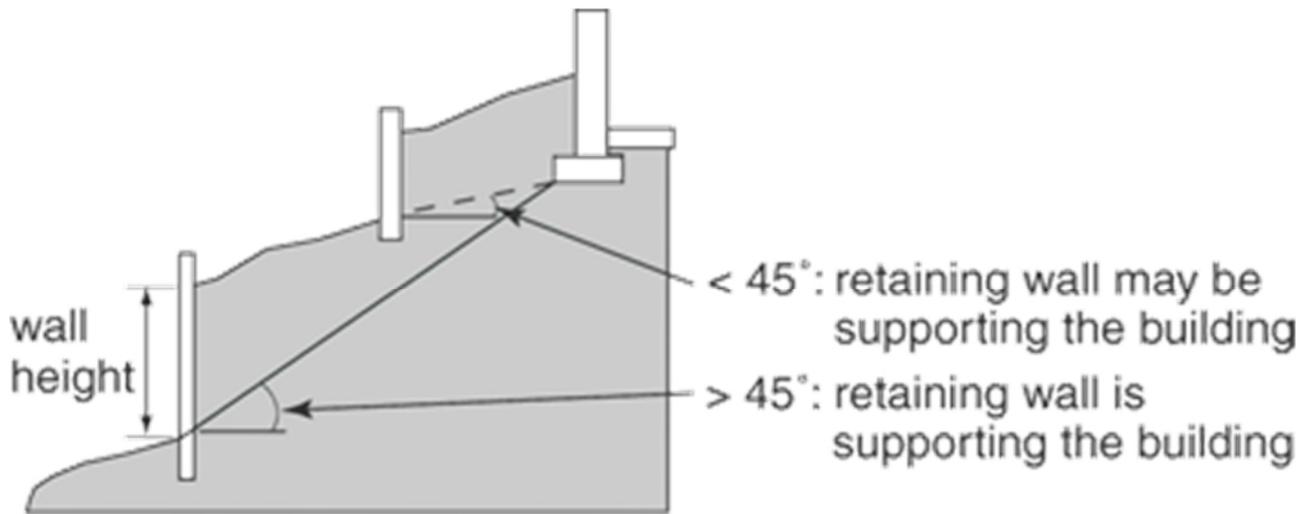
**Geotechnical Assessment  
UBCO Daycare Upgrades  
Kelowna, BC**

**Saturated Hydraulic Conductivity Estimation Based on  
Gradation (Medium Bulk Density)**

Project No. 191064  
Client: UBCO  
Office: Kelowna  
Scale: NTS  
Date: 01/02/2019  
DWN: CF CHK: CC



**Figure 2.0**



EG02051A

**Notes:**

BCBC 2018 Appendix A-9.3.2.9.(4)

**Geotechnical Assessment  
UBCO Daycare Upgrades  
Kelowna, BC**

**Influence Zone of Retaining Walls as per  
BCBC 2018 Appendix A-9.3.2.9.(4)**

Project No. 191064  
Client: UBCO  
Office: Kelowna  
Scale: NTS  
Date: 2020-01-02  
DWN: CF CHK: CC



**Figure 3.0**

# Appendix A

---

## General Conditions

## 1. Standard of Care

Ecora Engineering and Resource Group Ltd. (Ecora) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

## 2. Basis and Use of the Report

This report and the recommendations contained in it are intended for the sole use of Ecora's Client, their agents and the applicable regulatory authorities. Ecora does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than Ecora's Client, their agents and the applicable regulatory authorities unless otherwise authorized in writing by Ecora. Any unauthorized use of the report is at the sole risk of the user. In order to properly understand the suggestions, recommendations and opinions expressed herein, reference must be made to the whole of the report. We cannot be responsible for use by any party of portions of the report without reference to the whole report.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of Ecora. Additional copies of the report, if required, may be obtained upon request.

## 3. Alternate Report Format

Where Ecora submits both electronic file and hard copy versions of reports, drawings and other project-related documents, only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by Ecora shall be deemed to be the original for the Project. Both electronic file and hard copy versions of Ecora's deliverables shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Ecora.

## 4. Soil, Rock and Groundwater Conditions

Classification and identification of soils, rocks and geological units have been based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Classification and identification of the type and condition of these materials or units involves judgment, and boundaries between different soil, rock or geologic types or units may be transitional rather than abrupt. Accordingly, Ecora does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Soil and groundwater conditions shown in the factual data and described in the report are the observed conditions at the time of their determination or measurement. Unless otherwise noted, those conditions form the basis of the recommendations in the report. Groundwater conditions may vary between and beyond reported locations and can be affected by annual, seasonal and meteorological conditions. The condition of the soil, rock and groundwater may be significantly altered by construction activities such as traffic, excavation, groundwater level lowering, pile driving, blasting on the site or on adjacent sites. Excavation may expose the soils to climatic elements such as freeze/thaw and wet /dry cycles and/or mechanical disturbance which can cause severe deterioration. Unless otherwise indicated the soil must be protected from these changes during construction.

## 5. Environmental and Regulatory Issues

The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at the site, unless otherwise specifically stated and identified in the report. The presence or implication(s) of possible surface and/or subsurface contamination resulting from previous activities or uses of the site and/or resulting from the introduction onto the site of materials from off-site sources are outside the terms of reference for this project and have not been investigated or addressed.

## 6. Sample Disposal

Ecora will dispose all soil and rock samples for 30 days following issue of this report. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

### **7. Construction Services**

During construction, Ecora should be retained to perform sufficient and timely observations of encountered conditions to confirm and document that the subsurface conditions do not materially differ from those interpreted conditions considered in the preparation of Ecora's report and to confirm and document that construction activities do not adversely affect the suggestions, recommendations and opinions contained in Ecora's report. Adequate field review, observation and testing during construction are necessary for Ecora to be able to provide letters of assurance, in accordance with the requirements of many regulatory authorities. In cases where this recommendation is not followed, Ecora's responsibility is limited to interpreting accurately the information encountered at the borehole locations, at the time of their initial determination or measurement during the preparation of the Report.

### **8. Job Site Safety**

Ecora is responsible only for the activities of our employees on the jobsite. The presence of Ecora's personnel on the site shall not be construed in any way to relieve the Client or any contractors on site from their responsibilities for site safety. The Client acknowledges that he, his representatives, contractors or others retain control of the site and that Ecora never occupy a position of control of the site. The Client undertakes to inform Ecora of all hazardous conditions, or other relevant conditions of which the Client is aware. The Client also recognizes that our activities may uncover previously unknown hazardous conditions or materials and that such a discovery may result in the necessity to undertake emergency procedures to protect our employees as well as the public at large and the environment in general.

### **9. Changed Conditions and Drainage**

Where conditions encountered at the site differ significantly from those anticipated in this report, either due to natural variability of subsurface conditions or construction activities, it is a condition of this report that Ecora be notified of any changes and be provided with an opportunity to review or revise the recommendations within this report. Recognition of changed soil and rock conditions requires experience and it is recommended that Ecora be employed to visit the site with sufficient frequency to detect if conditions have changed significantly. Drainage of subsurface water is commonly required either for temporary or permanent installations for the project. Improper design or construction of drainage or dewatering can have serious consequences. Ecora takes no responsibility for the effects of drainage unless specifically involved in the detailed design and construction monitoring of the system.

### **10. Services of Sub consultants and Contractors**

The conduct of engineering and environmental studies frequently requires hiring the services of individuals and companies with special expertise and/or services which we do not provide. Ecora may arrange the hiring of these services as a convenience to our Clients. As these services are for the Client's benefit, the Client agrees to hold the Company harmless and to indemnify and defend Ecora from and against all claims arising through such hiring's to the extent that the Client would incur had he hired those services directly. This includes responsibility for payment for services rendered and pursuit of damages for errors, omissions or negligence by those parties in carrying out their work. In particular, these conditions apply to the use of drilling, excavation and laboratory testing services.

# Appendix B

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## Test Pit Logs

# TEST PIT: TP19-01

Project: UBCO Daycare Upgrades

Project No: 191064

Location: 1262 Discovery Ave, Kelowna, BC

Client: The University of British Columbia

Zone: 11 Northing: 5534933.4

Easting: 327751.99

Elevation:



DEPTH (m)	GRAPHICAL LEGEND	DESCRIPTION (For Explanation of Terms, Symbols and Abbreviations See Attached Key Sheet)	PARTICLE SIZE DISTRIBUTION			CLASSIFICATION TESTS	IN-SITU SHEAR VANE TEST		DEPTH (ft)
			GRAVEL (%)	SAND (%)	FINES (%)		REMOULDED (kPa)	PEAK (kPa)	
		<b>SILT (TOPSOIL)</b> (0 m to 0.2 m) SILT, sandy, trace gravel, trace organics (rootlets), moist, dark brown							
	x	<b>SAND and SILT (GLACIOFLUVIAL DEPOSITS)</b> (0.2 m to 0.4 m) Compact SAND and SILT, some clay, some gravel, moist to wet, brownish grey							
	o	<b>SAND (GLACIOFLUVIAL DEPOSITS)</b> (0.4 m to 0.9 m) Compact SAND, gravelly, some rounded cobble up to 200 mm, trace silt, moist, brown							
		End of test pit at 0.9 m below existing site grades - target depth reached.							

## PHOTOGRAPH



2018 - TEST PIT LOG - 191064 UBCO DAYCARE UPGRADES.GPJ.DAT/ECORAZ2018.GDT 1/20/20

Contractor: On The Mark  
Excavator Type:

Logged By: CF  
Reviewed By: CC

Started: 2019-12-19  
Completed: 2019-12-19

Completion Depth: 0.9m  
Page 1 of 1

# TEST PIT: TP19-02

Project: UBCO Daycare Upgrades

Project No: 191064

Location: 1262 Discovery Ave, Kelowna, BC

Client: The University of British Columbia

Zone: 11 Northing: 5534953.21

Easting: 327772.74

Elevation:



DEPTH (m)	GRAPHICAL LEGEND	DESCRIPTION (For Explanation of Terms, Symbols and Abbreviations See Attached Key Sheet)	SAMPLE TYPE	PARTICLE SIZE DISTRIBUTION			CLASSIFICATION TESTS	IN-SITU SHEAR VANE TEST		DEPTH (ft)
				GRAVEL (%)	SAND (%)	FINES (%)		REMOULDED (kPa)	PEAK (kPa)	
0		<b>GRAVEL (FILL)</b> (0 m to 0.25 m) Subrounded ~9.5 mm GRAVEL, poorly graded, grey/brown								
0.25		<b>SAND (GLACIOFLUVIAL DEPOSITS)</b> (0.25 m to 0.9 m) Compact SAND, some silt, trace gravel, moist, brown	B	1.8	73.1	25.1	●			
0.9		<b>SAND (GLACIOFLUVIAL DEPOSITS)</b> (0.9 m to 1.7 m) Loose to compact fine grained, sand, trace silt, dry to moist, light brown								
1.7		<b>CLAY (GLACIOLACUSTRINE DEPOSITS)</b> (1.7 m to 2.4 m) Very stiff to hard CLAY, silty, trace sand, medium to high plasticity, grey	B				●	75		
2.4		End of test pit at 2.4 m below existing site grades - target depth reached.								

## PHOTOGRAPH



2018 - TEST PIT LOG 191064 UBCO DAYCARE UPGRADES.GPJ.DAT/ECORA2018.GDT 1/20/20

Contractor: On The Mark  
Excavator Type:

Logged By: CF  
Reviewed By: CC

Started: 2019-12-19  
Completed: 2019-12-19

Completion Depth: 2.4m  
Page 1 of 1

# TEST PIT: TP19-03

Project: UBCO Daycare Upgrades

Project No: 191064

Location: 1262 Discovery Ave, Kelowna, BC

Client: The University of British Columbia

Zone: 11

Northing: 5534920.86

Easting: 327775.29

Elevation:



DEPTH (m)	GRAPHICAL LEGEND	DESCRIPTION (For Explanation of Terms, Symbols and Abbreviations See Attached Key Sheet)	SAMPLE TYPE	PARTICLE SIZE DISTRIBUTION			CLASSIFICATION TESTS			IN-SITU SHEAR VANE TEST		DEPTH (ft)
				GRAVEL (%)	SAND (%)	FINES (%)	PLASTIC	M.C.	LIQUID	REMOULDED (kPa)	PEAK (kPa)	
0		<b>SILT (TOPSOIL)</b> (0 m to 0.3 m) SILT, sandy, trace gravel, some organics (tree roots/rootlets), moist, dark brown										
0.3	x	<b>SAND (FILL)</b> (0.3 m to 0.5 m) Fine grained SAND, some silt, trace gravel, some organics (poorly graded, dry, brown)										
0.5	x	<b>SAND (GLACIOFLUVIAL DEPOSITS)</b> (0.5 m to 1.8 m) Fine grained SAND, some silt, trace gravel, trace organics (rootlets), poorly graded, dry, brown										
1.8		<b>CLAY (GLACIOLACUSTRINE DEPOSITS)</b> (1.8 m to 2.1 m) Very stiff to hard CLAY, silty, trace sand, medium to high plasticity, grey										
2.1		End of test pit at 2.1 m below existing site grades - target depth reached.										
			B	15.2	71.0	13.8						

## PHOTOGRAPH



2018 - TEST PIT LOG 191064 UBCO DAYCARE UPGRADES.GPJ.DATACORAZ2018.GDT 1/20/20

Contractor: On The Mark  
Excavator Type:

Logged By: CF  
Reviewed By: CC

Started: 2019-12-19  
Completed: 2019-12-19

Completion Depth: 2.1m  
Page 1 of 1

# Appendix C

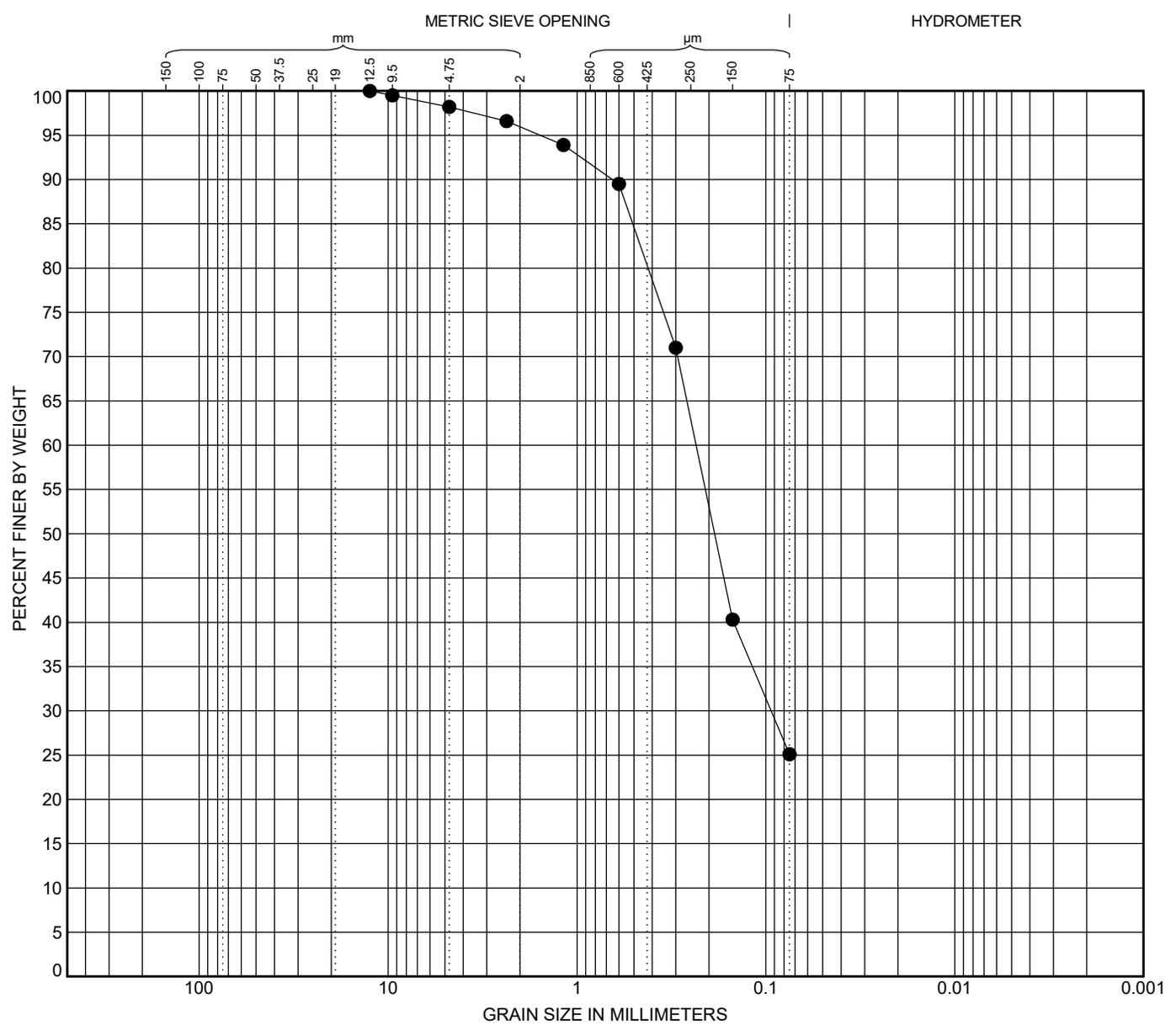
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## Lab Analysis Results

# GRAIN SIZE DISTRIBUTION ASTM C136

Project: UBCO Daycare Upgrades  
 Location: 1262 Discovery Ave, Kelowna, BC  
 Sample Location/Source: TP19-02

Project No: 191064  
 Client: The University of British Columbia  
 Depth: 0.5 m to 0.7 m



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

D <sub>100</sub>	D <sub>85</sub>	D <sub>60</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>	%Gravel	%Sand	%Silt	%Clay
12.5	0.507	0.234	0.094					1.8	73.1		25.1

GRAIN SIZE DISTRIBUTION 191064 UBCO DAYCARE UPGRADES.GPJ DATAECORA2018.GDT 1/18/20

Description: Sand, finey, trace gravel  
 Natural Moisture Content: 9.4 %  
 Material Specification:  
 Intended Use:  
 Comments: TP19-02

Sample Number: 008-20  
 Date Tested: 2019-01-07  
 Tested By: DB

Checked By:

## ATTERBERG LIMITS ASTM D423, D424



**Project:** UBCO Daycare Upgrades  
**Location:** 1262 Discovery Avenue, Kelowna, BC.  
**Sample Location/Source:** TP19-02 @ 1.8 to 2.0 meters

**Project No.:** 191064  
**Client:** UBCO

### LIQUID LIMIT (ASTM Designation D 423)

Trial Number	1	2	3
Tare Number	L1	L2	L3
Number of Blows	27	23	19
Mass of Wet Soil and Tare (g)	36.77	35.58	33.86
Mass of Dry Soil and Tare (g)	27.79	27.19	26.12
Mass of Tare (g)	15.71	16.01	16.00
Mass of Moisture (g)	8.98	8.39	7.74
Mass of Dry Soil (g)	12.08	11.18	10.12
Moisture Content(%)	74.3	75.0	76.5

### PLASTIC LIMIT (ASTM Designation D 424)

Trial Number	1	2
Tare Number	P1	P2
Mass of Wet Soil and Tare (g)	21.28	21.18
Mass of Dry Soil and Tare (g)	20.16	19.98
Mass of Tare (g)	16.07	15.64
Mass of Moisture (g)	1.12	1.2
Mass of Dry Soil (g)	4.09	4.34
Moisture Content (%)	27.4	27.6

### Test Results

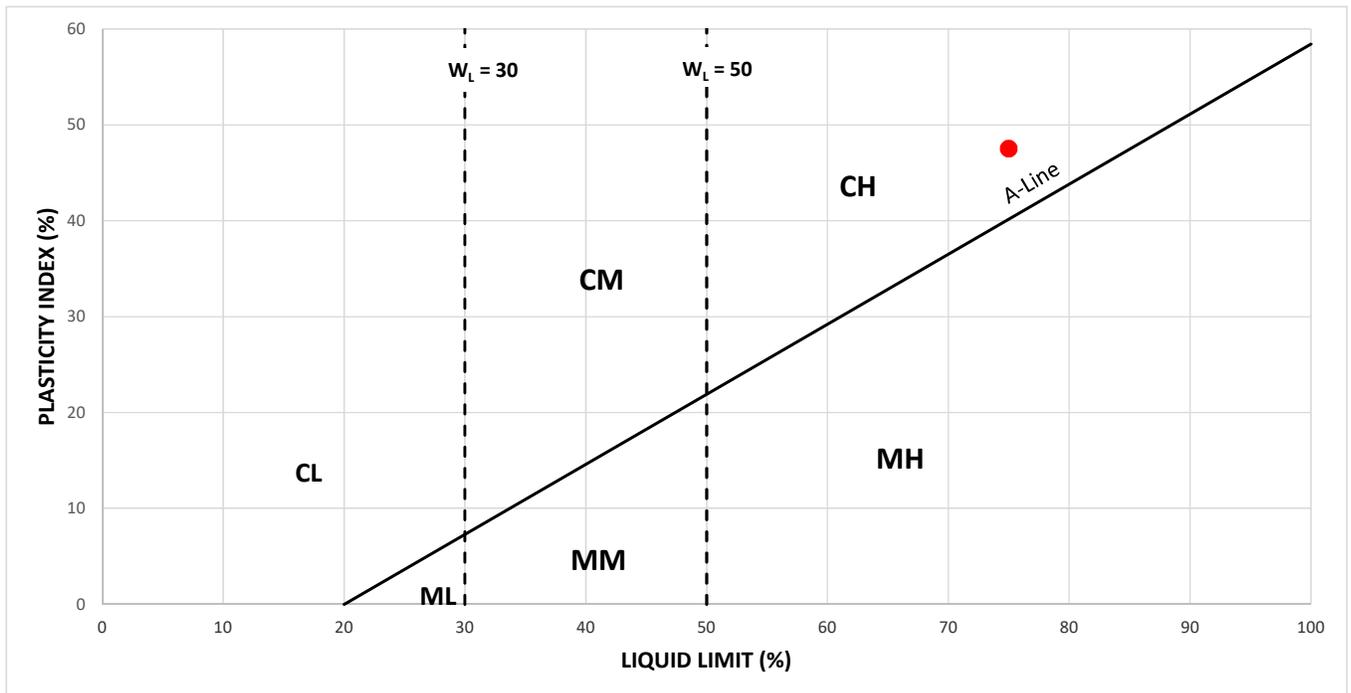
Liquid Limit: **75**  
 Plastic Limit: **28**  
 Plasticity Index: **47**

### Plasticity Classification (based on Liquid Limit $W_L$ )

0 to 30 Low Plasticity  
 30 to 50 Medium Plasticity  
 > 50 High Plasticity

**Sample Description:** CH - High Plastic Clay  
**Natural Moisture Content:** N/A

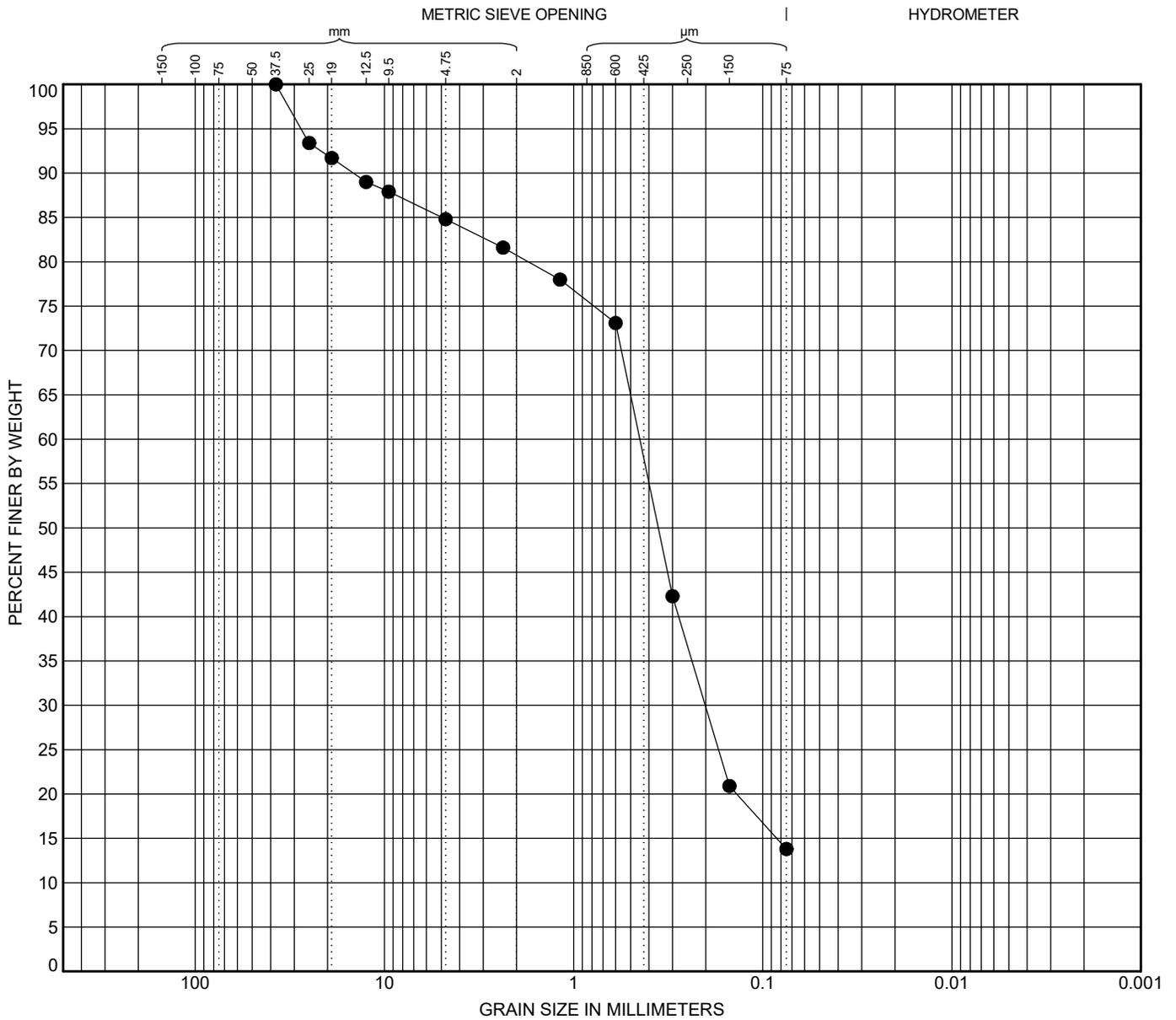
**Sample Number:** 20-009  
**Date Tested:** 2019-01-07  
**Tested by:** DB  
**Checked by:** SK



# GRAIN SIZE DISTRIBUTION ASTM C136

Project: UBCO Daycare Upgrades  
 Location: 1262 Discovery Ave, Kelowna, BC  
 Sample Location/Source:

Project No: 191064  
 Client: The University of British Columbia  
 Depth: 0.8 m to 1 m



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

D <sub>100</sub>	D <sub>85</sub>	D <sub>60</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>	%Gravel	%Sand	%Silt	%Clay
37.5	4.967	0.447	0.201	0.084				15.2	71.0		13.8

GRAIN SIZE DISTRIBUTION 191064 UBCO DAYCARE UPGRADES.GPJ DATAECORAZ2018.GDT 1/18/20

Description: Sand, some gravel, some fines  
 Natural Moisture Content: 4.3 %  
 Material Specification:  
 Intended Use:  
 Comments:

Sample Number: 010-20  
 Date Tested: 2020-01-07  
 Tested By: DB

Checked By:

# Photos



T: ENTRY TO CHILDCARE FROM THE EAST  
B: NORTHEAST CORNER OF CHILDCARE



T: ELEVATION BETWEEN CHILDCARE AND UPPER  
CASCADES RESIDENCE TO THE NORTH  
B: NORTHWEST VIEW OF CHILDCARE



T: PARKING LOT OF CHILDCARE FACING SOUTH  
B: SIDE VIEW OF THE BACK OF CHILDCARE



# Drawing Set



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ISSUES + REVISIONS		
NO.	DATE	DESCRIPTION
A	July 20, 2022	Issue for SD

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TEL: 604 728 4323  
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UBCO Childcare

1262 Discovery Ave, Kelowna, BC

PROJECT CODE  
2016  
SCALE

Cover sheet

SHEET  
A0.00

UBCO CHILD CARE - 1262 DISCOVERY AVENUE - KELLOWNA, BC - 2022.07.20

## Project statistics

Building Footprint:	588.5 sqm
Project Boundary:	approx. 2,800 sqm
Net floor area*:	427.3 sqm
Gross Floor Area:	493.9 sqm
Building height:	5.228 m
Setbacks	
From South exiting campus parking lot:	6.132 m
From East Child care site boundary:	12 m
From West Child care site boundary:	12.919 m
From North existing childcare building:	5.166 m
Parking Spaces:	relocating existing parking stalls number to remain as existing
Loading:	
Bicycle Parking Spaces (long term)	
Bicycle Parking Spaces (short term)	
Number of children in 3-5 cohort:	25
Number of children in IT cohort:	12
Number of staff:	8

\*Net floor area has been calculated per the City of Kelowna Zoning Bylaw No. 8000 definition.

## Legal description

### Building code summary

Regulated by:	BCBC 2018, Part Step Code 1
Major occupancy:	A-2

## Project team

**Project manager**  
Robert Major, PMP, AS-T, OSC, LEED® Green Associate  
Major Project Management Ltd.  
Address  
T: (403) 700-4419  
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**Construction manager**  
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**Landscape**  
Byron Douglas, MBCLSA CSLA  
CTQ Consultants  
1334 St. Paul Street, Kelowna,  
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T: (250) 979-1221, Ext. 135  
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BC, V1Y 2E1, Canada  
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E: SCadieux@ctqconsultants.ca

## Drawing list

### Sheets - architectural

A0.0 - General	
A0.00	Cover sheet
A0.01	Project information and drawing list
A0.02	Legends and abbreviations
A0.03	Assemblies
A0.04	Washroom accessibility requirements
A0.05	Typical mounting heights
A0.06	Area plan
A0.10	Context plan
A0.20	Shadow plan
A1.0 - Floor and ceiling plans	
A1.00	Slab plan
A1.10	Floor plan - L1
A1.20	RCP - L1
A1.30	Roof plan
A2.0 - Elevations	
A2.01	Elevation - west and east
A2.02	Elevation - north and south
A3.0 - Sections	
A3.01	Building sections
A3.02	Building sections
A3.10	Wall sections
A4.0 - Large scale drawings	
A4.01	Rm 100 - floor plan, RCP, elevations
A4.10	Rm 200 - floor plan, RCP, elevations
A5.0 - Details	
A5.01	Plan details - ext
A5.10	Section details - ext
A5.20	Plan details - int
A5.30	Section details - int
A6.0 - Schedules	
A6.01	Door and frame schedule
A6.10	Window schedule
A6.20	Room finish schedule
A7.0 - Vertical circulation	
A7.01	Stair #1

### Sheets - architectural demolition

A01.0 - Floor and ceiling plans	
A00.01	Demolition site plan

### Sheets - interior

I1.0 - Floor and ceiling plans	
I1.01	Finish plan - L1
I1.10	Furniture plan - L1
INFO	
INFO-01	Getting started

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ISSUES - REVISIONS	NO.	DATE	DESCRIPTION
A		July 20, 2022	Issue for SD

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UBCO Childcare

1262 Discovery Ave., Kelowna, BC

PROJECT CODE  
2016  
SCALE

Project information  
and drawing list

SHEET  
A0.01

**Keynote legend**

Keynote	Description
151000	HVAC - see mech
241010	Service transformer - see elec
GBA1	
GBA2	
GBA3	
GBA4	
GBA5	
GBA6	
GBA7	
GBA8	

**Equipment legend \*Note: delete unused\***

-  duplex receptacle - see electrical
-  fourplex receptacle - see electrical
-  single pole switch - see electrical
-  occupancy sensor - see electrical
-  vacancy sensor - see electrical
-  exit sign - see electrical
-  fire alarm pull station - see electrical
-  fire alarm gong/speaker - see electrical
-  smoke alarm - see electrical
-  smoke detector - see electrical
-  floor box - see electrical
-  linear light - see electrical
-  pot light - see electrical
-  supply air - see mechanical
-  return air - see mechanical
-  exhaust air - see mechanical
-  supply air, wall-mounted - see mechanical
-  return air, wall-mounted - see mechanical
-  ceiling-mounted sprinkler - see mechanical
-  wall-mounted sprinkler - see mechanical
-  thermostat - see mechanical
-  floor drain - see mechanical
-  camera - see security
-  WAP - see communications

**Graphic legend**

-  north arrow
-  grid line identification
-  LEVEL NAME / 1000 elevation relative to main floor
-  drawing number / sheet number / section reference
-  room number / area / room tag
-  D022b door tag / refer to schedule
-  W02 window tag / refer to schedule
-  A003 assembly tag / refer to assembly schedule
-  ceiling elevation
-  centre line
-  existing construction to remain
-  existing construction to be demolished
-  new construction
-  0hr fire separation
-  1hr fire separation
-  2hr fire separation

**Abbreviation Legend**

- aff = above finished floor
- cl = centre line
- c/w = complete with
- eq = equal
- exist = existing
- ext = exterior
- int = interior
- max = maximum
- min = minimum
- na = not applicable
- nic = not in contract
- oc = on centre
- osci = owner supplied contractor installed
- osoi = owner supplied owner installed
- rec = recessed
- reqd = required
- rm = room
- sim = similar
- tme = to match existing
- t/o = top of
- typ = typical
- uno = unless noted otherwise
- u/s = underside
- vf = verify in field
- w/ = with

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ISSUES / REVISIONS	
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A	July 20, 2022 Issue for SD

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**UBCO Childcare**

1262 Discovery Ave., Kelowna, BC

PROJECT CODE  
 2016  
 SCALE  
 As indicated

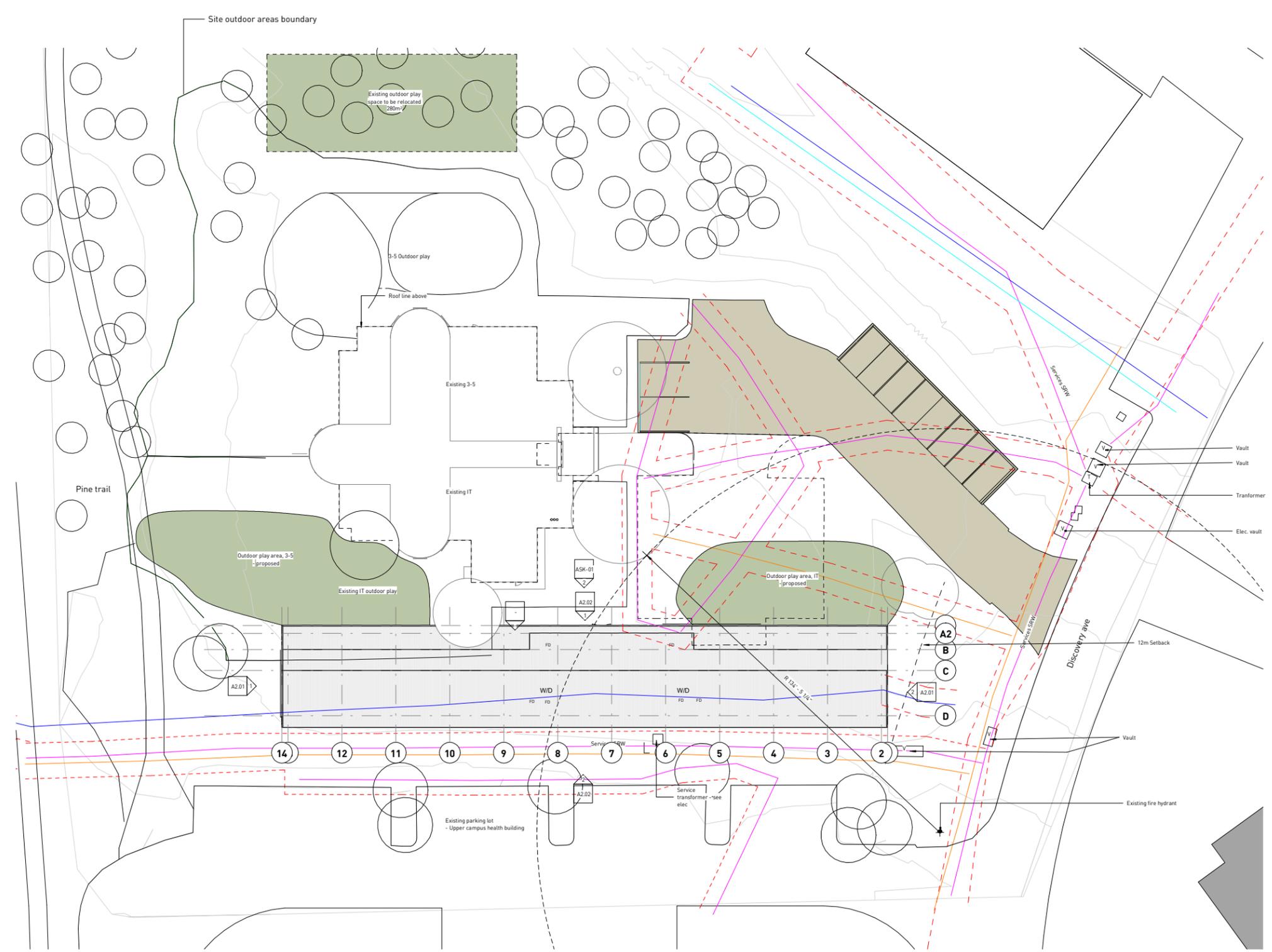
Legends and abbreviations

SHEET  
**A0.02**



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ISSUES + REVISIONS		
NO.	DATE	DESCRIPTION
A	July 20, 2022	Issue for SD



- Communication
- Gas
- Storm
- Sanitary
- Power
- - - 3m Service setback
- New outline of parking lot
- Outdoor play area - proposed
- Outdoor play area - existing to be relocated

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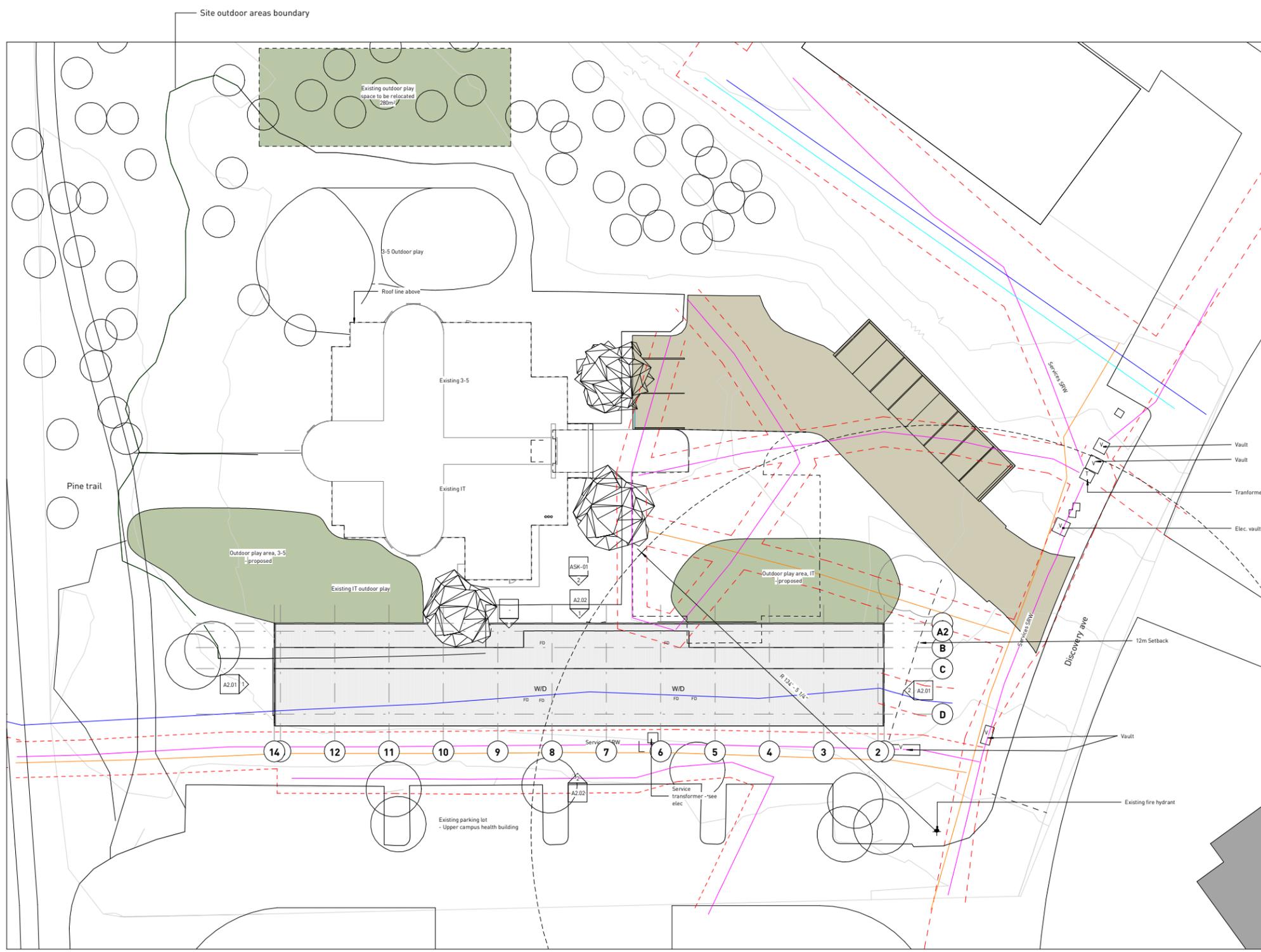
PROJECT CODE  
 2016  
 SCALE  
 As indicated

**Site plan**  
 SHEET  
**A0.10**

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ISSUES + REVISIONS		
NO.	DATE	DESCRIPTION
A	July 20, 2022	Issue for SD



- Communication
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 SCALE  
 As indicated

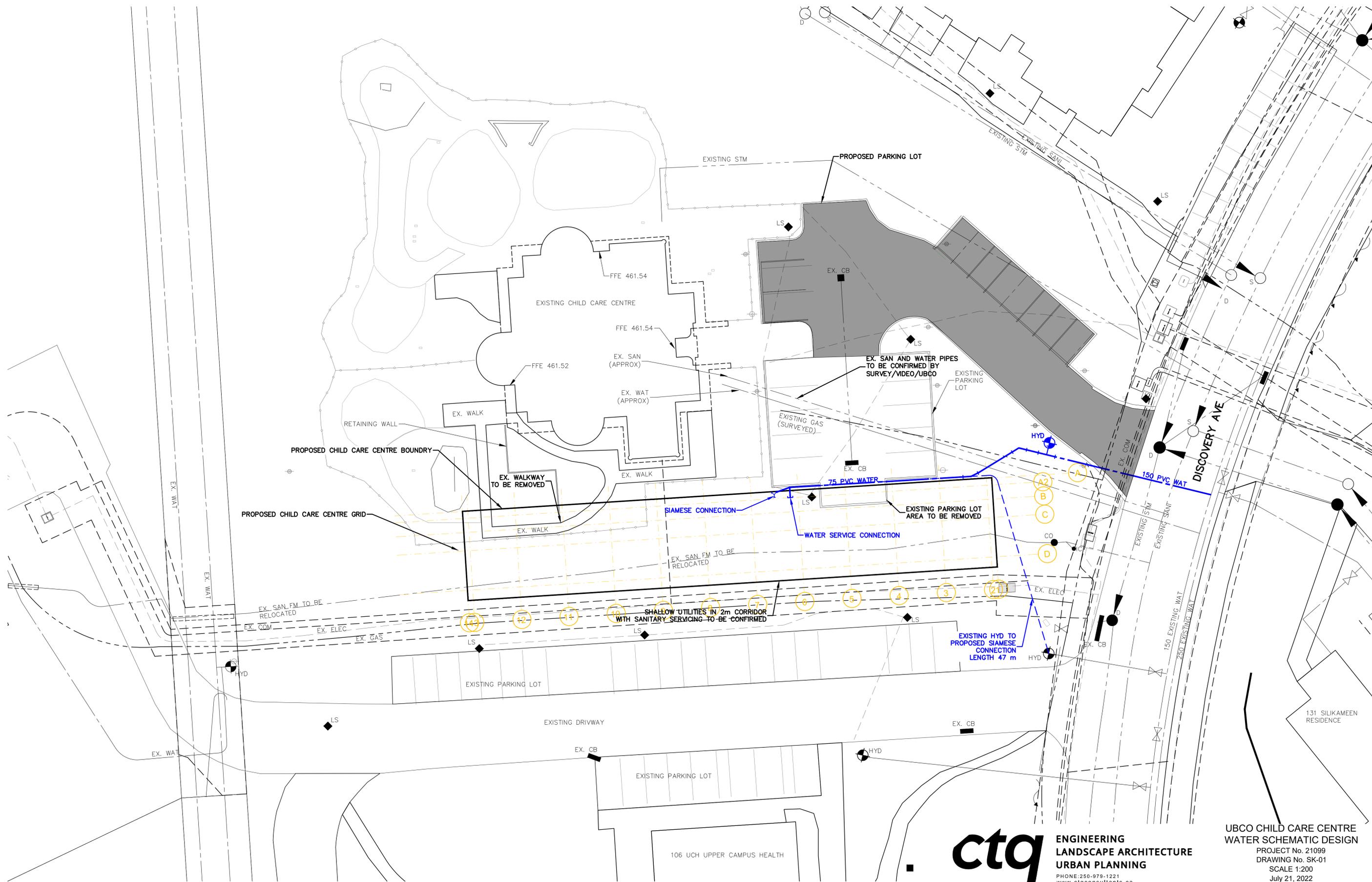
**Context plan**  
 SHEET  
**A0.10**

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:\Projects-2021\21099 - UBCO New Child Learning Centre\4-CAD\SKETCHES\21099-SK-02-SCHEMATIC DESIGN.dwg July 21, 2022 Michael De Bonis

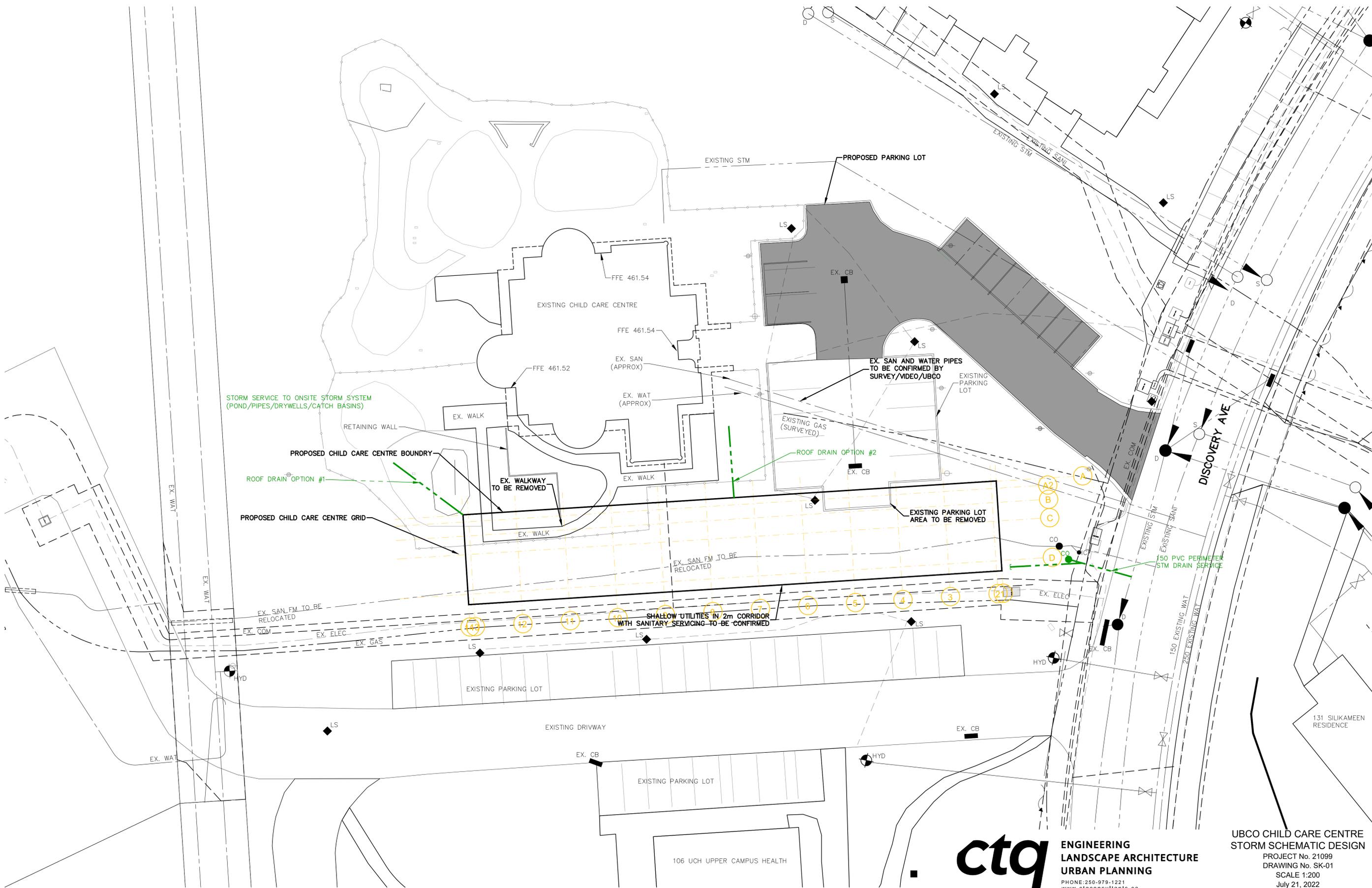


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 URBAN PLANNING  
 PHONE: 250-979-1221  
 www.ctqconsultants.ca

UBCO CHILD CARE CENTRE  
 WATER SCHEMATIC DESIGN  
 PROJECT No. 21099  
 DRAWING No. SK-01  
 SCALE 1:200  
 July 21, 2022



\\Projects-2021\21099 - UBCO New Child Learning Centre\4-CAD\SKETCHES\21099-SK-02-SCHEMATIC DESIGN.dwg July 21, 2022 Michael De Bonis



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UBCO CHILD CARE CENTRE  
 STORM SCHEMATIC DESIGN  
 PROJECT No. 21099  
 DRAWING No. SK-01  
 SCALE 1:200  
 July 21, 2022

131 SILIKAMEEN RESIDENCE

106 UCH UPPER CAMPUS HEALTH

DISCOVERY AVE

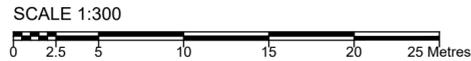
**SITE PLAN OF UBC DAYCARE CENTER WITHIN PART OF LOT A SECTIONS 10 AND 11 TOWNSHIP 23 OSOYOOS DIVISION YALE DISTRICT PLAN KAP87188 EXCEPT PART ON PLAN EPP57644 AND EPP53665**

PID: 027-594-564  
 CLIENT: UBC PROPERITES  
 CIVIC ADDRESS: 1262 DISCOVERY AVENUE

HORIZONTAL COORDINATE SYSTEM: UTM 11 NAD83(CSRS)  
 VERTICAL DATUM: CGVD28 (DERIVED FROM CANNET STATION BC\_Kelowna)

FIELD SURVEY COMPLETED: MAY 21, 2021

REFER TO THE CURRENT STATE OF TITLE FOR CHARGES, LIENS, AND INTERESTS AFFECTING THIS LAND.



**LEGEND**

- Subject Property
- Major Contour (1.0m)
- Minor Contour (0.2m)
- Top Slope
- Bottom Slope
- Fence
- Treeline
- Fire Hydrant
- Lamp Standard
- Tree (dia.)
- Sanitary Manhole
- Drainage Manhole
- Water Valve
- Bollard
- Catch Basin
- Sign
- Asphalt
- Pedestal
- Vault
- Transformer
- Clean Out
- Curb Stop
- Irrigation Box
- Denotes Rubber Surface
- Denotes Concrete Surface
- Denotes Retaining Wall
- Underground Gas Line
- Underground Power Line
- Underground Communication Line
- Underground Storm Line
- Underground Sanitary Line
- Underground Water Line
- Underground Irrigation Line

REM PART OF E 1/2 SEC 10 TP 23 SHOWN AS DITCH ROW ON PLAN 1638



1 PLAN EPP60261

EASEMENT PLAN EPP94901

**CALL BEFORE YOU DIG.** THE LOCATION OF THE UNDERGROUND FACILITIES ARE APPROXIMATE ONLY. THIS PLAN WAS PREPARED FOR DESIGN PURPOSES AND IS FOR THE EXCLUSIVE USE OF OUR CLIENT. BOUNDARIES SHOWN ARE SUBJECT TO CHANGE WITH LEGAL SURVEY. VECTOR GEOMATICS LAND SURVEYING LTD. ACCEPTS NO RESPONSIBILITY OR LIABILITY FOR ANY DAMAGES THAT MAY BE SUFFERED BY A THIRD PARTY AS A RESULT OR REPRODUCTION, TRANSMISSION, OR ALTERATION TO THIS DOCUMENT WITHOUT THE CONSENT OF VECTOR GEOMATICS LAND SURVEYING LTD.

DRAWING REVISIONS		
Revision #	Date	Description
0	2021-05-25	Original Issue
1		
2		
3		

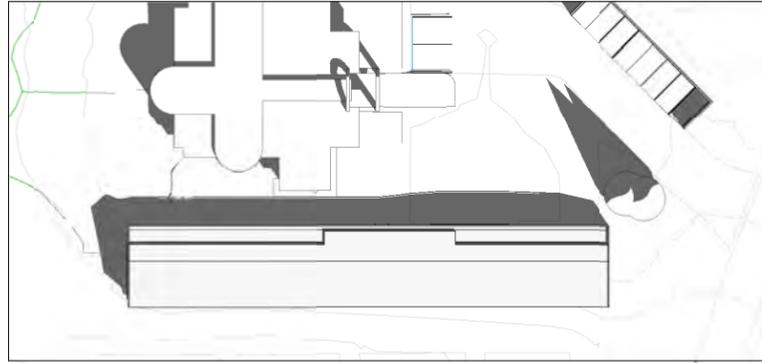
**VECTOR**  
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 Kelowna, B.C. V1Y 4N7  
 Ph.: (250) 868-0172  
 www.vectorgeomatics.com

File: 2101278R0 Date: 2021-05-25  
 Drafted by: EC Checked by: TF

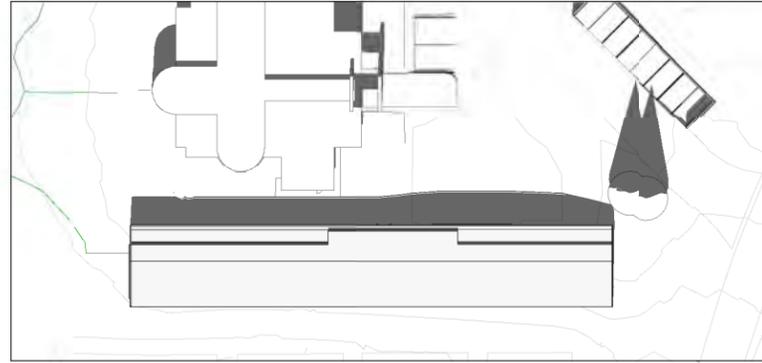
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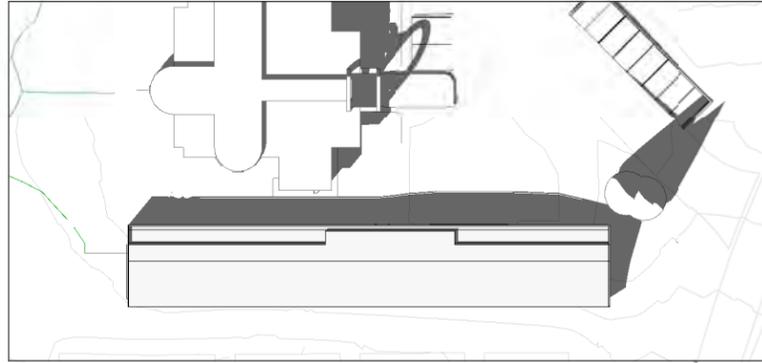
ISSUES - REVISIONS	NO.	DATE	DESCRIPTION
B	July 24, 2022	Issue for DA	



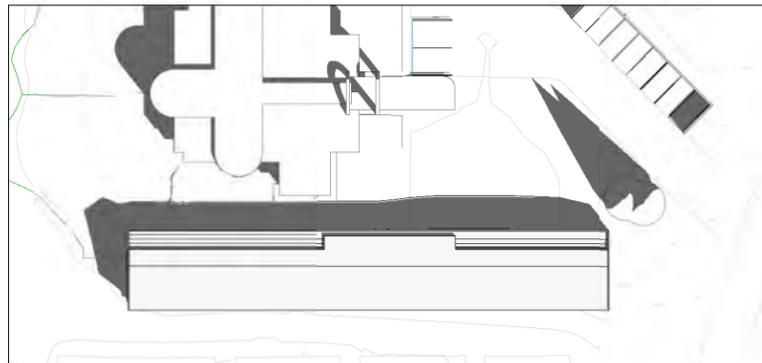
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1/A3.01 1/32" = 1'-0"



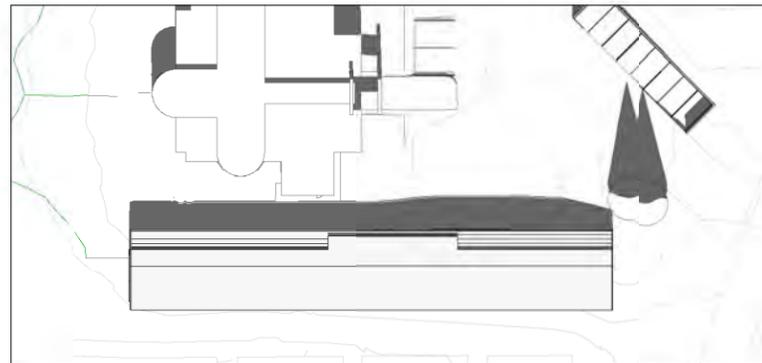
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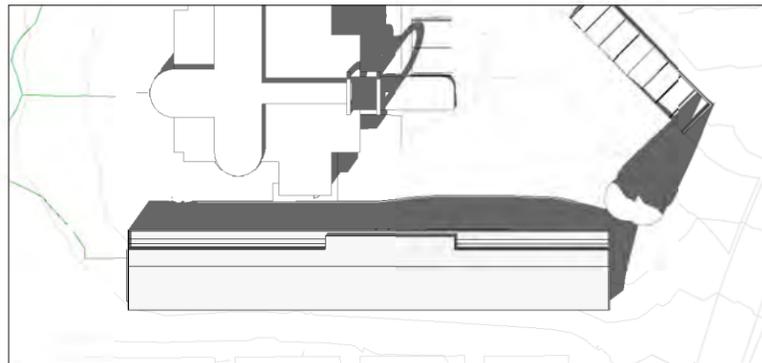
1 Shadow study - fall equinox 2pm  
1/A3.01 1/32" = 1'-0"



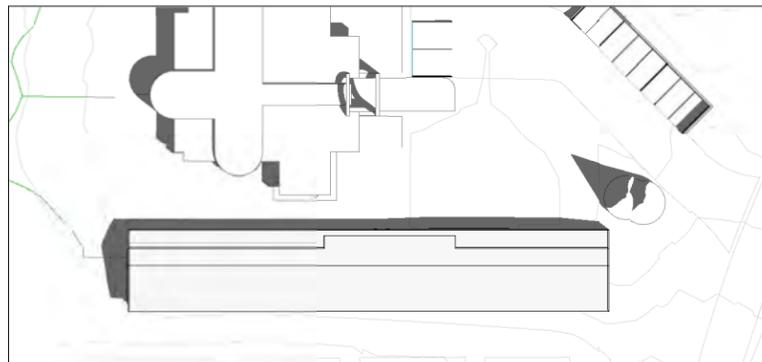
4 Shadow study - spring equinox 10am  
1/A3.01 1/32" = 1'-0"



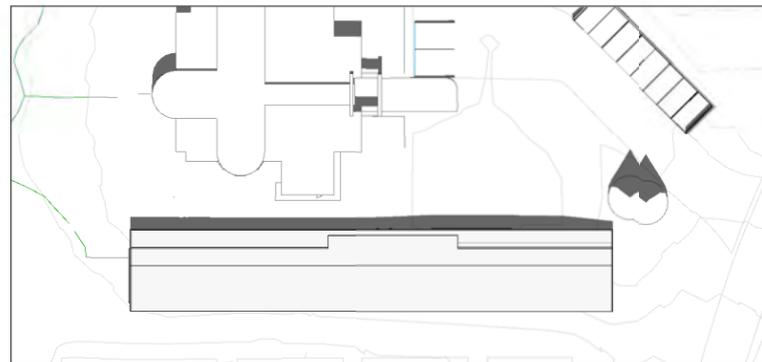
5 Shadow study - spring equinox 12am  
1/A3.01 1/32" = 1'-0"



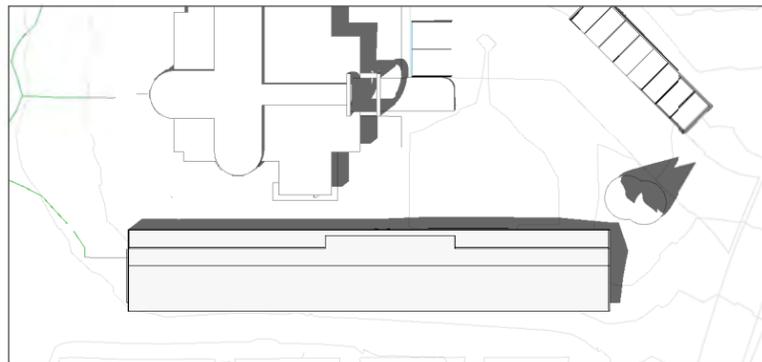
9 Shadow study - spring equinox 2pm  
1/A3.01 1/32" = 1'-0"



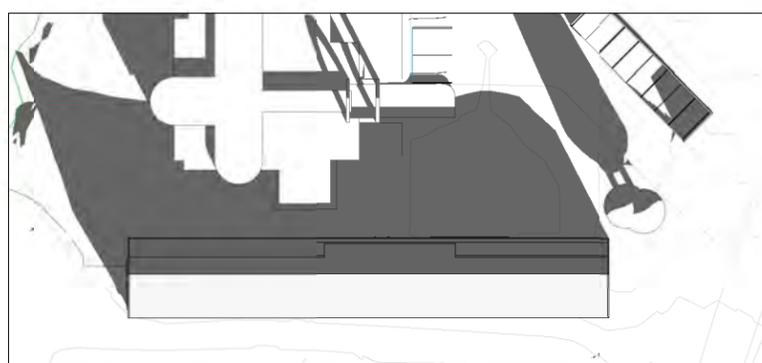
7 Shadow study - summer solstice 10am  
1/A3.01 1/32" = 1'-0"



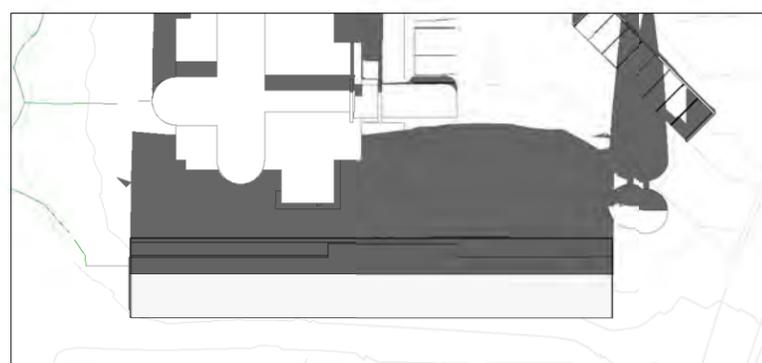
8 Shadow study - summer solstice 12pm  
1/A3.01 1/32" = 1'-0"



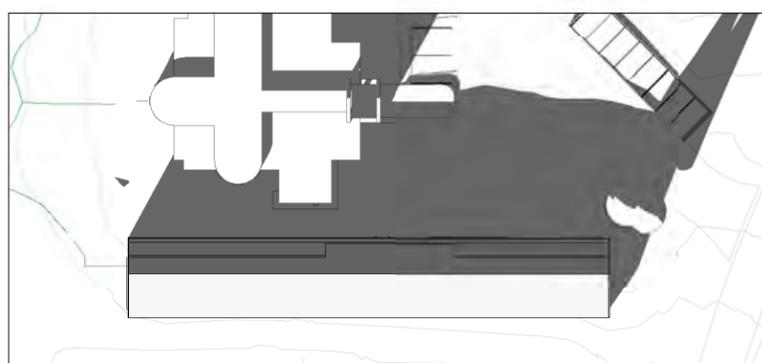
6 Shadow study - summer solstice 2pm  
1/A3.01 1/32" = 1'-0"



10 Shadow study - winter solstice 10am  
1/A3.01 1/32" = 1'-0"



11 Shadow study - winter solstice 12pm  
1/A3.01 1/32" = 1'-0"



12 Shadow study - winter solstice 2pm  
1/A3.01 1/32" = 1'-0"

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---

**UBCO Childcare**

---

1262 Discovery Ave, Kelowna, BC

TRUE NORTH 

---

PROJECT CODE  
2016  
SCALE  
1/32" = 1'-0"

---

Shadow plan

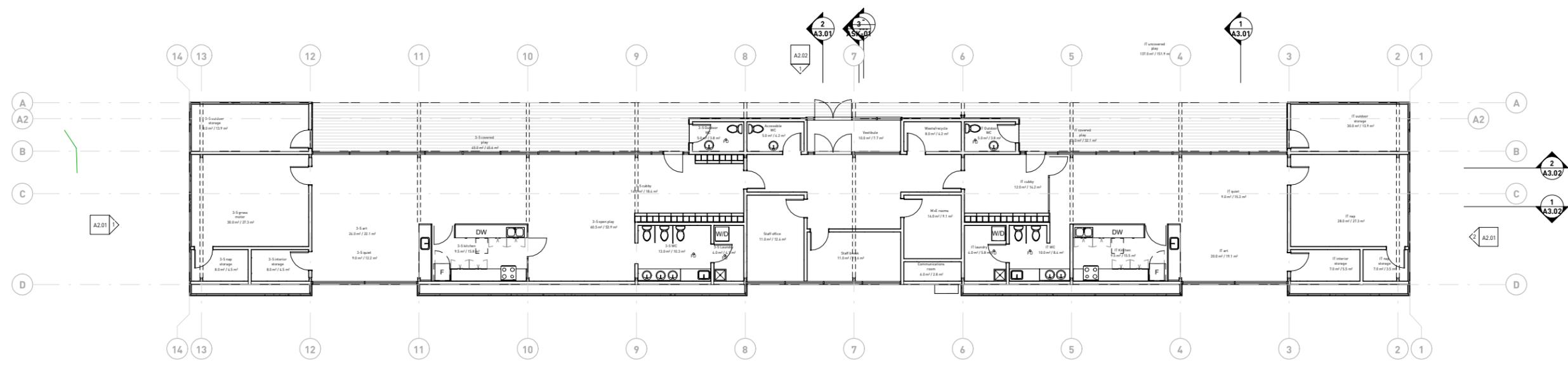
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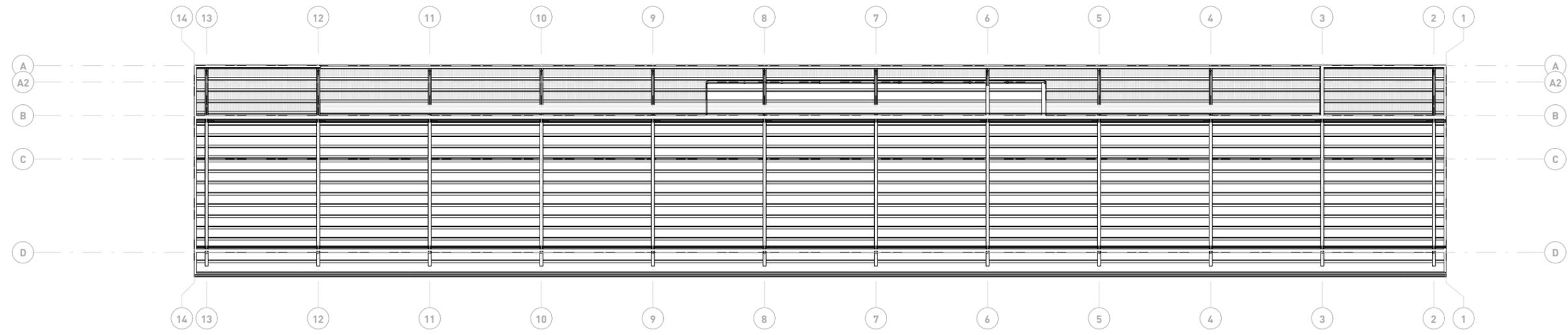
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Floor plan - L1  
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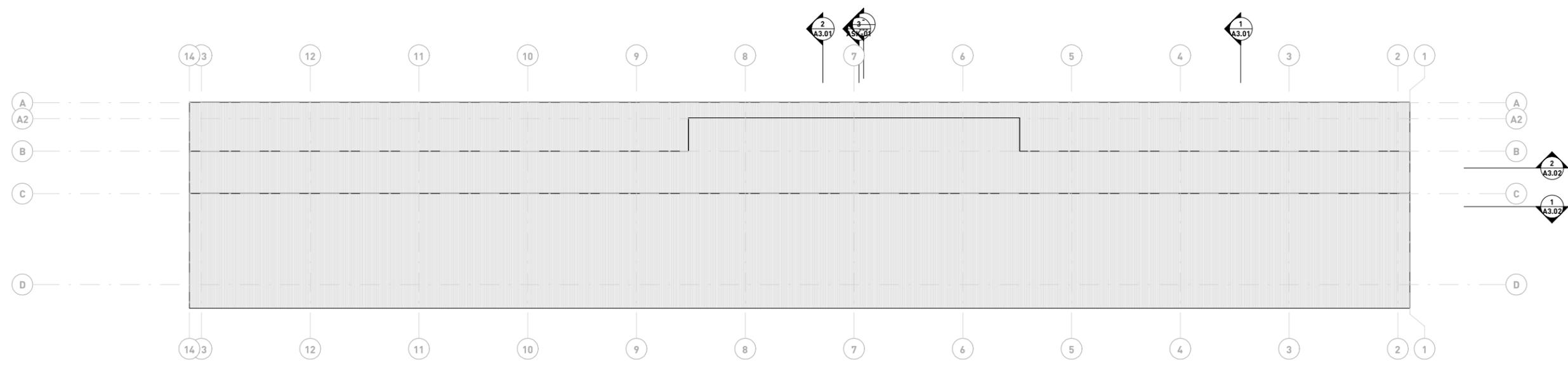
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RCP - L1  
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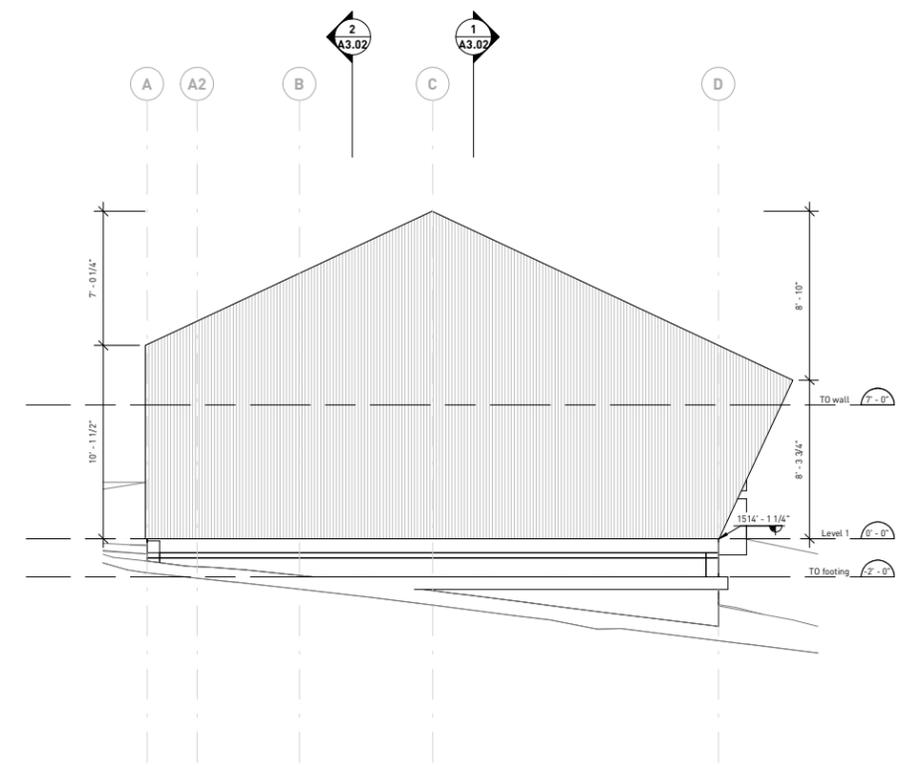
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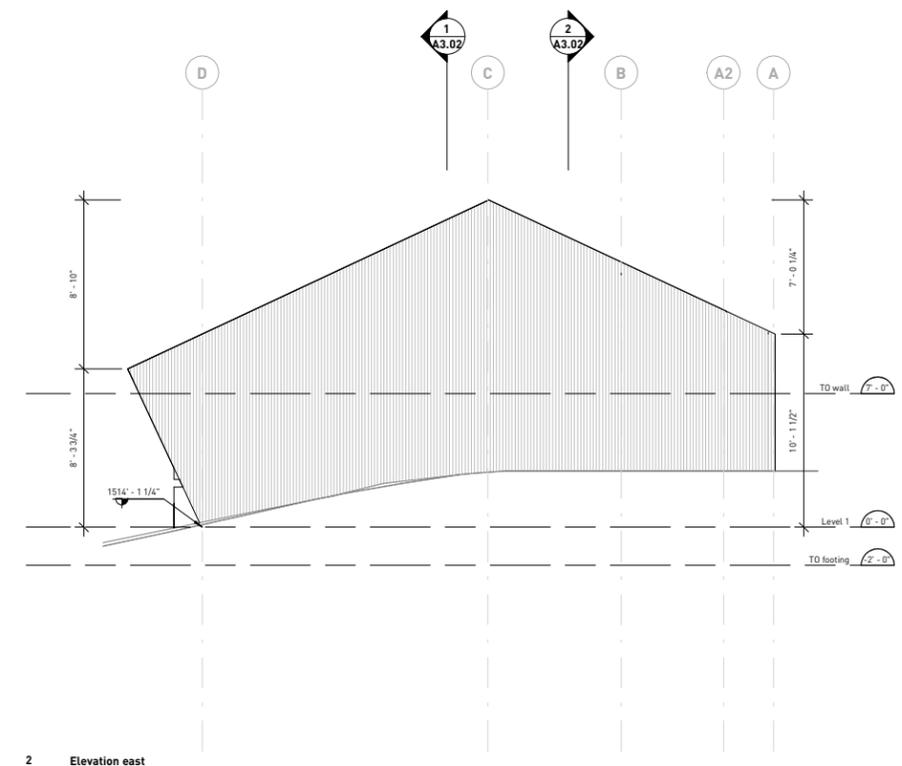
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1 Elevation west  
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2 Elevation east  
1/A0.10 1/4" = 1'-0"

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SCALE  
1/4" = 1'-0"

Elevation - west and east  
SHEET  
A2.01

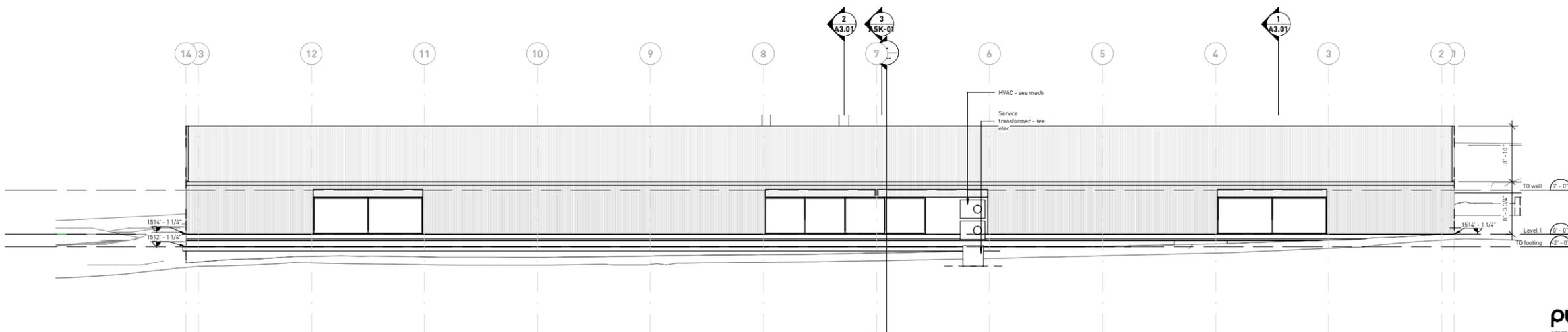
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1 Elevation north  
1/ A0.10 1/8" = 1'-0"



2 Elevation south  
1/ A0.10 1/8" = 1'-0"

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PROJECT CODE  
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SCALE  
1/8" = 1'-0"

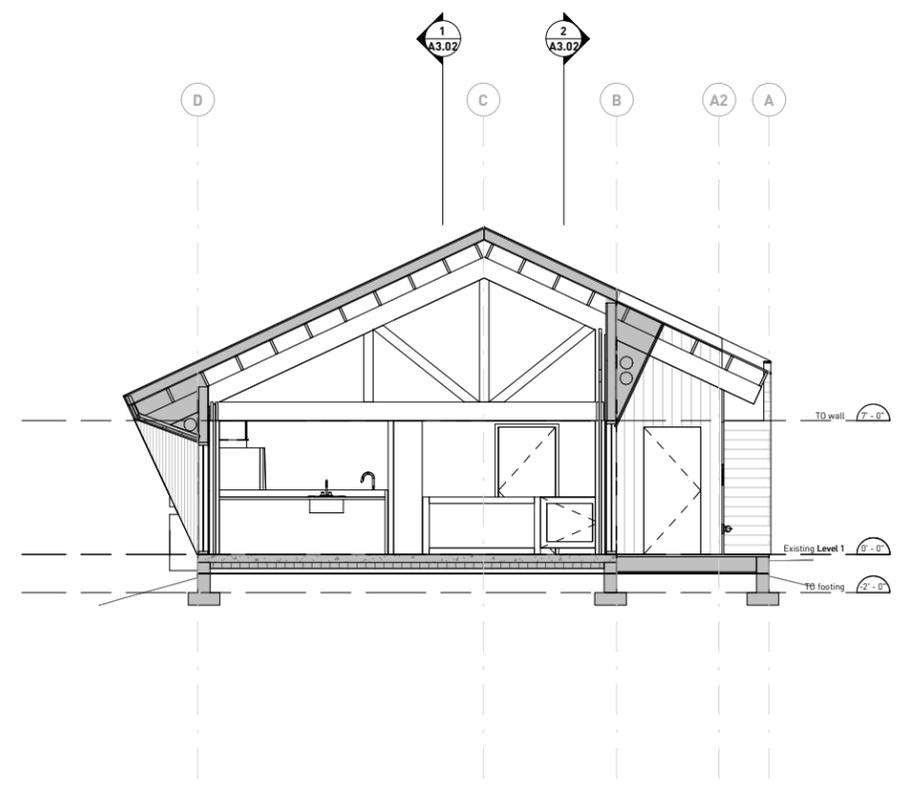
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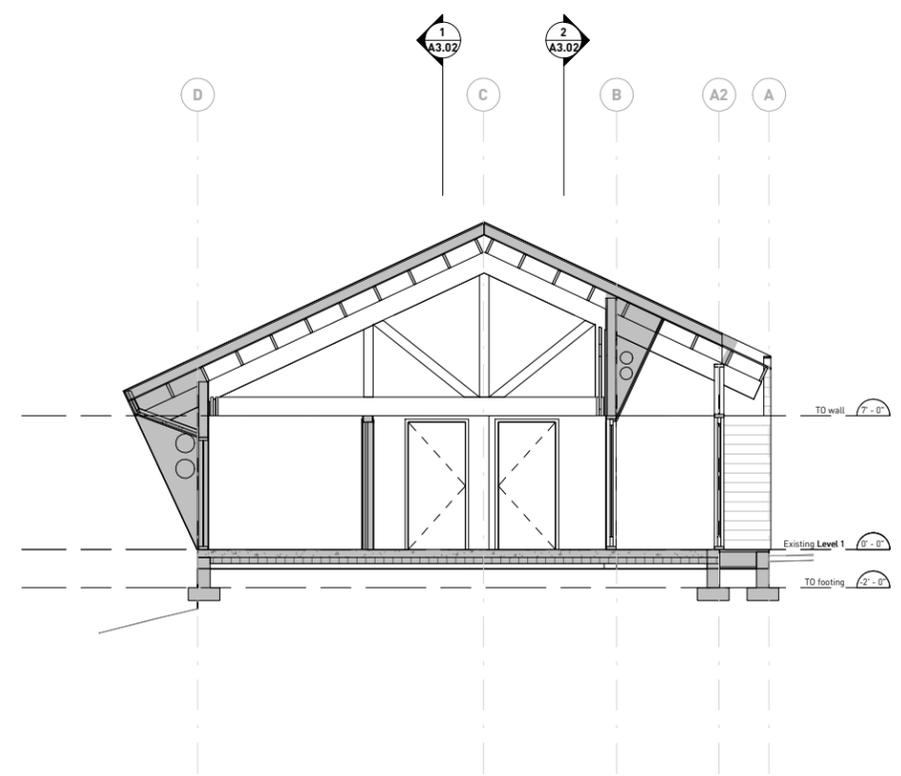
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**1 Section transverse play area**  
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**2 Section transverse vestibule**  
1/A1.10 1/4" = 1'-0"

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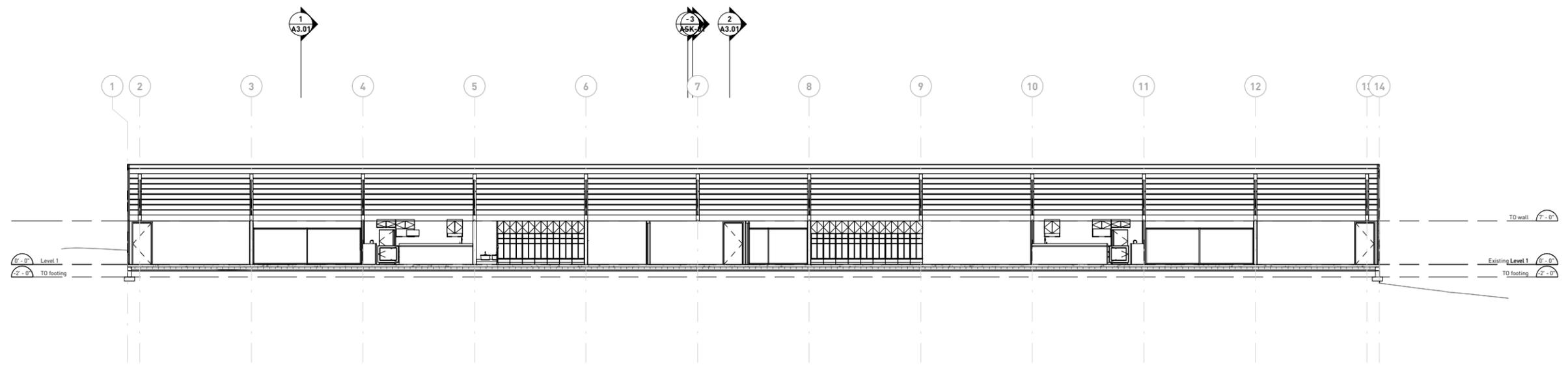
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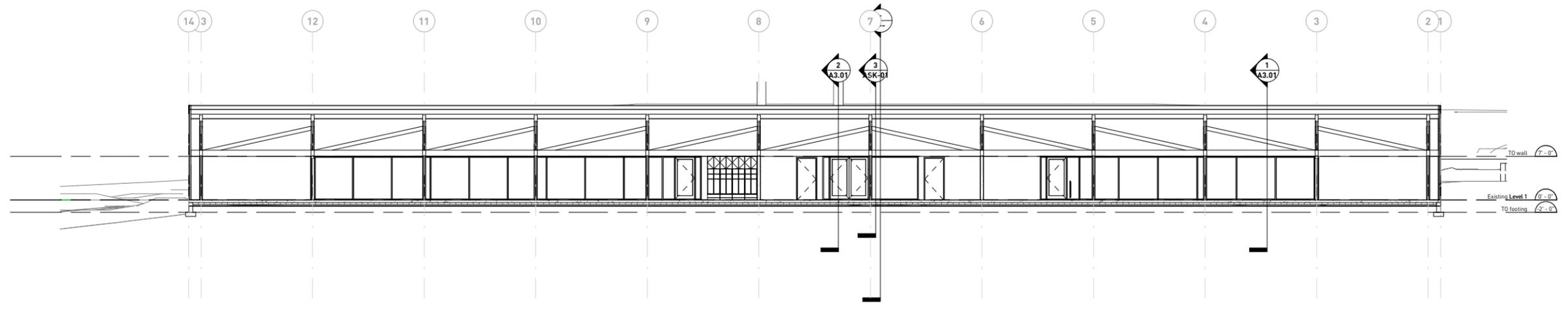
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1 Section longitudinal looking south  
1/A1.10 1/8" = 1'-0"



2 Section longitudinal looking north  
1/A1.10 1/8" = 1'-0"

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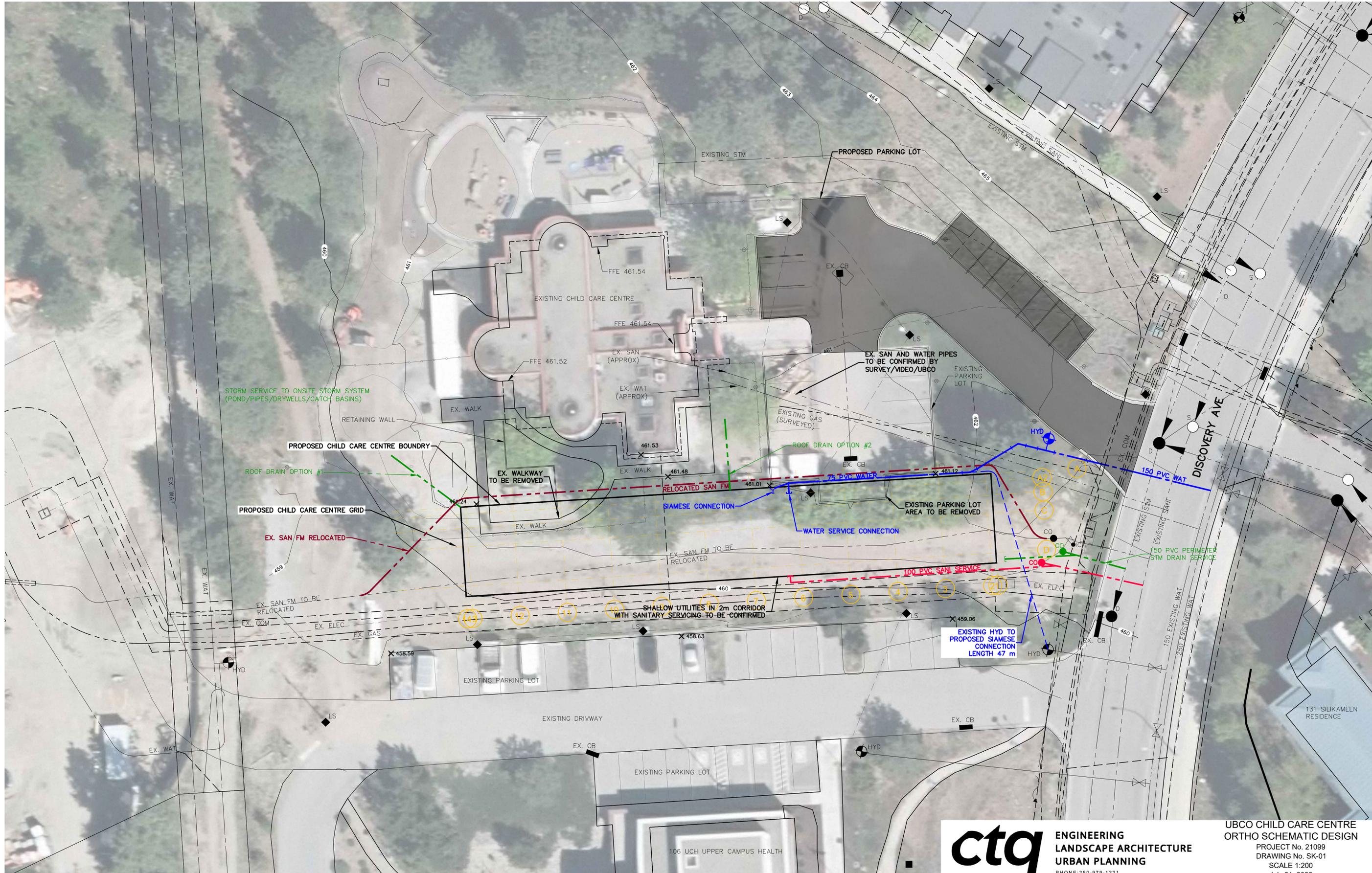
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UBCO CHILD CARE CENTRE  
 ORTHO SCHEMATIC DESIGN  
 PROJECT No. 21099  
 DRAWING No. SK-01  
 SCALE 1:200  
 July 21, 2022

**UBCO**

# Schematic Design Report

UBC Childcare

CIMA+ file number: C41-0069A  
July 19<sup>th</sup>, 2022





# Schematic Design Report

UBC Childcare

Customer's project number / file number

Prepared by:

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Verified by:

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CIMA+ file number: C41-0069A  
July 19th, 2022

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**Appendix B** Proposed Mechanical Design

**Appendix C** Proposed Lighting Layouts

**Appendix D** Lighting Cutsheets

## 1. Introduction

The intent of this Schematic Design and Basis of Design report is to describe the building systems for the new Child Care Facility that will be located next to the existing Child Care Facility at UBC Okanagan Daycare Building at 1262 Discovery Avenue. This document provides design systems descriptions for a better understanding of the systems design intent based on the owner's project requirements.

The report focuses on the major components of the building systems. Minor and conventional system components are not elaborated in detail as part of this report. Nonetheless, these systems and components are required for proper building operation and shall remain as part of the scope. The details of these systems and components are developed as part of the construction documentation and will be included in the final system design.

## 2. Project summary

The expansion of the Child Care Facility will be provided as new facility to be located next to the existing UBC Okanagan Daycare Building at 1262 Discovery Avenue. The new Child Care Facility will be a single storey building area with approximately 5,600 ft<sup>2</sup>.

## 3. Structural

### 3.1 Foundations

A geotechnical assessment was prepared by Ecora Engineering & Resource Group on January 20, 2020. The study was prepared for the demolition of two covered deck areas to be rebuilt and enclosed to increase the interior space of the existing building.

An additional study for the new building is currently underway.

The recommendations issued in this report are based on the January 2020 assessments. Validations will be required once the new geotechnical report is issued.

#### Frost Protection

As per the geotechnical report, the frost penetration depth is estimated at 0.6m below ground surface. Therefore, the underside of footings should be placed at least 0.6m below the final site grade. *Information to be validated in the revised geotechnical assessment.*

#### Bearing capacity

As per the geotechnical report, shallow foundations placed directly on approved subgrade or structural fill shall be designed for an allowing bearing pressure of 75kPa. *Information to be validated in the revised geotechnical assessment.*

## Conclusion

The allowing bearing capacity (assuming it does not change) is sufficient for a single-story wood building. The perimeter of the building shall consist of a concrete foundation wall supported by strip footings. Additional strip and spread footings will be required to support the column and shear walls throughout the building. A key plan of the proposed footings is shown on plan S01. See Appendix A.

## 3.2 Building Structure

### 3.2.1 Ground floor

A concrete slab-on-grade shall be used for the ground floor. As mentioned in the geotechnical report, it should be supported on a minimum 100mm thick layer of under-slab fill consisting of 19mm minus crushed gravel, overlaying approved native subgrade material, or structural fill. The under-slab shall be compacted to a minimum 100% SPMDD. *Information to be validated in the revised geotechnical assessment.*

### 3.2.2 Roof Structure

Based on Public's renderings issued for Schematic Design, the roof structure shall consist of mass timber / glulam trusses spaced at 18' o/c. Three different types of trusses are expected (for a total of 12):

- + RT-1: Supported at GL-A, B & D.
- + RT-2: Supported at GL-B & D, cantilevered to GL-A.
- + RT-3: Supported at GL-A.2, B & D.

Each truss location is shown on plan S02. See Appendix A.

Lumber joists spaced at 2' o/c shall frame between trusses. Plywood shall be used as roof sheeting and diaphragm. The screwing pattern shall be designed to resist the applicable lateral loads.

### 3.2.3 Columns

The columns supporting the roof trusses shall be concealed in the exterior or interior partitions and shall consist of mass timber / glulam or conventional lumber. A key plan of the proposed column locations is shown on plan S01. See Appendix A.

### 3.2.4 Shear Walls

A key plan of the proposed shear wall locations is shown on plan S01. See Appendix A.

## 4. Mechanical

### 4.1 Design Objective

The project will follow Step 1 Targets of the BC Energy Step Code of the BCBC 2018 and UBC's sustainability policies require new buildings incorporate design strategies and energy systems toward the achievement of a 65% greenhouse gas reduction by 2030 and a 2050 net positive goal.

#### 4.1.1 Code and Standard

The mechanical systems will be designed and installed according to the following principles of good engineering practice. They will meet or exceed requirements of all applicable codes, including but not limited to the following list of codes, ordinances and guidelines:

- + BCBC 2018: BC Building Code
- + BC Energy Step Code – Step 1
- + NECB 2020: National Energy Code of Canada for Building
- + ASHRAE 62– 2001: Ventilation for Acceptance Indoor Air Quality (except Addendum N)
- + ASHRAE 90.1 – 2016: Energy Standard for Buildings Except Low-Rise Residential Buildings
- + ASHRAE 55-2013: Thermal Environmental Conditions for Human Occupancy
- + CSA B51 – 2014: Boiler, Pressure Vessel and Pressure Piping Code
- + NFPA 10 – 2013: Standard for Portable Fire Extinguishers
- + NFPA 13 – 2013: Installation of Sprinkler Systems

## 4.1.2 Outdoor and Indoor Design Conditions

External heat gain and heat loss calculations for sizing mechanical systems are performed using the most stringent outdoor “Design Day” conditions and the corresponding indoor design conditions that the building system shall maintain. Traditionally, the design temperature used for the design of the mechanical system is based on the BC Building Code, which is based on the 25 years preceding 2006. As seen in the last few years, the summer temperatures have increased significantly. As such, the climatic design conditions of the project will be in line with the approach listed in the UBCO Technical Guidelines using the current BCBC2018 design temperature and adjusted with the 2050s higher range of change (90<sup>th</sup> percentile). This results in the following:

BCBC 2018, Kelowna	DESIGN CONDITIONS
Heating (January) 1%	-20 °C
Heating (January) 2.5%	-17 °C
Cooling (July) 2.5% Dry- Bulb	33 °C db
Cooling (July) 2.5% Wet- Bulb	20 °C wb

Cooling Design Conditions for Climate Adaption Planning – Suggested for UBCO ICI: Kelowna	DESIGN CONDITIONS
2050s Dry-Bulb Design Temperature	37.6 °C db
2050s Wet-Bulb Design Temperature	24.2 °C wb

### 4.1.2.1 Cooling Load Allowances

Apart from the outdoor conditions, the cooling load calculations depend on the amount of internal heat gains. The following allowances shall be made for the cooling systems.

ITEM	COOLING LOAD
People	75 W sensible + 50 W latent
Lighting Power Density:	12.0 W/m <sup>2</sup>
Plug Load:	7.5 W/m <sup>2</sup>

#### 4.1.2.2 Proposed Envelope Design Criteria

The performance of the building envelope shall meet or exceed the following minimum requirements to ensure the HVAC design criteria and cooling load allowances in the previous sections are appropriate for this project.

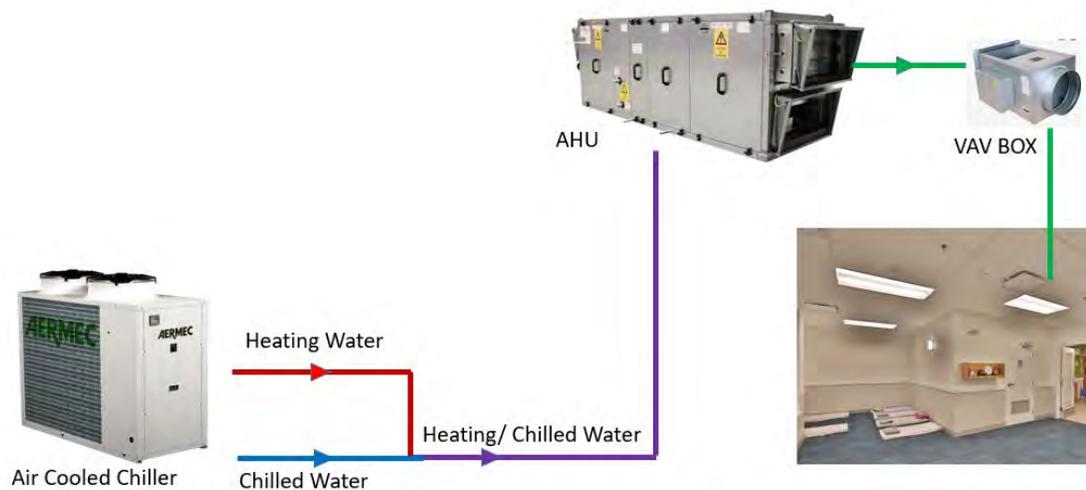
ASSEMBLY	MAXIMUM U-VALUE (W/M <sup>2</sup> K)
Above-Ground Opaque Building Walls	0.265
Above-Ground Opaque Building Roofs	0.156
Above-Ground Opaque Building Floors	0.175
In Contact with the Ground Walls	0.379
In Contact with the Ground Roofs	0.379
In Contact with the Ground Floors	0.757 for 1.2m
Glazing	1.90

### 4.1.3 Heating, Cooling and Ventilation Systems

The mechanical design intent is to provide an Air Source Heat Pump(s) (ASHP) system. The building will operate as a cooling/heating switch-over system providing either heating or cooling to the building. The air source heat pump will provide chilled water in the summer to the buffer tank located in the mechanical. In the winter, the air source heat pump will provide heating water. An adequate deadband will be used to avoid switching over from heating to cooling and vice-versa during a short period of time. A local outdoor air reset controller will provide the heating/cooling mode decision based on a few days of average temperature. Heating/chilled water will be piped to an Air Handling Unit (AHU) to provide ventilation to the space. The supply AHU will be designed as a variable volume unit with VFD installed on the motors. The VFD will be controlled to primarily meet the outdoor air change rates for carbon dioxide control but will also be controlled to help with peak in the summer and free cooling in the shoulder seasons.

The child care facility will be zoned to seven different zones. A VAV box is to be provided to each zone c/w thermostat and CO<sub>2</sub> sensor to control the air flow to each zone.

AHU will be connected to ductwork that route through the space with ceiling mounted diffuser to distribute ventilation air. Air from the space shall be returned to the AHU. Refer to figure 1 below for an illustration of the proposed system.



**Figure 1: Ventilation System**

Natural Ventilation will be done through operable windows and doors which can provide free cooling and fresh air during moderate ambient condition. A proximity switch will be provided on the windows to disable the cooling when windows are open. It is to note that bug screen shall be provided at each window.

The supply AHU will consist of isolation damper; filter (Merv 13), switch over heating-cooling coil, an enthalpy recovery wheel, face bypass, centrifugal fan, VFD motor and silencer. The unit should be capable to produce 3000 CFM.

In addition, with the higher occurrence of wildfires in the Okanagan region, recommendations from Health Canada Guidance for Cleaner Air Spaces during Wildfire Smoke Events, will be implemented such as the increased filtration level (MERV 13) and an allowance for a recirculation mode.

### Vestibule

Electric force flow heater shall be provided to the Vestibule.

### Waste/Recycle Room and Outdoor Washroom

An energy recovery unit (ERV) shall be provided to exhaust the air for the Waste/Recycle Room and Outdoor washroom.

### Mechanical and Electrical Room

Fan coil connected to chilled water supply and return shall be provided to provide cooling to the M+E Room.

### Communicate Room

Exhaust fan shall be provided to exhaust the heat out of the Communication Room.

### Radon Mitigation System

Spray foam floor insulation will be provided under the architectural scope of work. The underfloor insulation will also be used as “membrane” for the radon mitigation system, instead of relying on the high-grade polyethylene membrane. A fan will be provided to create negative pressure under the building to prevent radon contamination to the occupied spaces.

## 4.2 PLUMBING

### 4.2.1 Service Connections

The following service connections will be required for the New Child Care Facility. The existing locations and inverts of these service shall be coordinated and confirmed with civil.

- + One 3" ø Domestic Water Connection
- + One 6" ø Fire connections and a Siamese's connection
- + One 4" ø Sanitary Drain Connection
- + One 6" ø Storm Drain Connection

### 4.2.2 Sanitary System

The sanitary system is to be designed to collect all waste from the building plumbing fixtures and direct the waste through the building and out to the sanitary system via gravity.

### 4.2.3 Storm System

New Child Care Facility shall be provided with a typical storm drainage system, redirecting the rain fall collected by the gutters to the storm sewer. In addition, a foundation drainage system that consists of 4"  $\varnothing$  perforated drain-tiles shall be provided around the perimeter. Storm water that cannot be drained by gravity to the building storm service shall be drained to the sump pump system downstream of the interceptor.

### 4.2.4 Domestic Water System

The new 3"  $\varnothing$  Domestic Water Connection will come from existing water main on Discovery Avenue into the new Child Care Facility mechanical and electrical room. The water meter shall be provided with pulse output for water consumption monitoring by the BMS.

### 4.2.5 Domestic Hot Water System

A 40 gallons 3KW electrical hot water tank will be installed in mechanical room to provide hot water to all the plumbing fixtures in the building.

### 4.2.6 Plumbing Fixtures

- + Water Closets (Floor-mounted) – 4.8 LPF (1.26 GPF)
- + Lavatories – 1.9 LPM (0.5 GPM)
- + Sinks – 5.7 LPM (1.5 GPM)
- + Locking frost proof hose bibs (at least one on each major building face)

## 4.3 FIRE PROTECTION

- + Wet sprinkler systems will be required throughout the space. Designed to BCBC 2018 and NFPA 13 requirements. Wet sprinkler systems shall be installed on all heated designed to Light Hazard occupancy utilizing standard coverage.
- + Dry pipe systems shall be utilized for all area subject to freezing including covered canopy. The design of the dry systems shall be Ordinary Hazard Group 1. During the following phase of the design, an option to delete the dry pipe system and use non-freeze sprinkler heads will be studied.
- + Extinguishers will be distributed in semi-recessed cabinets with BCBC 2018 and NFPA 10.

#### 4.4 BUILDING AUTOMATION AND CONTROLS

Provide complete building management system (BMS) to monitor and control all mechanical systems including the ventilation systems, domestic water booster system, sanitary and storm sump pump systems. ASHP/Boiler heating and cooling systems shall come with proprietary controls for controlling the system and components to maintain heating and chilled water temperature setpoints. BMS shall monitor general status and alarm of the heating and cooling systems via BACnet connections. Provide full graphical user interface (GUI) to the BMS including remote web access and trend logging capability for a minimum period of one year.

#### 4.5 GENERAL ITEMS OF NOTE

- + Vibration and sound isolation will be provided for all mechanical equipment. Vibration isolation is to be provided for all mechanical equipment with fans, motors, compressors, etc.
- + Balancing of the air and water systems and documentation containing detailed instructions for maintenance and operation of mechanical systems and components shall be by an independent firm.
- + Manufacturer start-up service on air source heat pumps, pumps, etc. with 5-year warranty of the major equipment (heat pumps) from start-up time.
- + Complete system of cleaning and chemical treatment for all systems, complete with supplier inspection, testing and certification will be included.
- + Motorized dampers on building air reliefs, intakes and exhaust openings.
- + Isolation valves shall be provided on plumbing systems to isolate each washroom group, fixture and on all mechanical equipment.
- + Washrooms, service rooms and common storage areas shall be heated and ventilated only.
- + Fire dampers on all ductwork penetrations at Fire Rated assemblies to meet Code requirements and mechanical specification.
- + Firestopping and smoke seals on all mechanical services that partially or completely penetrate fire rated building components to municipal requirements.
- + Access doors and panels required for servicing or accessing mechanical equipment or components. Fire rated construction for access into fire rated building components.

## 5. Electrical

### 5.1 Design Objective

The project will design and construct a proposed 520m<sup>2</sup> (5,600 ft<sup>2</sup>) UBCO Child Learning Care that will be located adjacent to the existing UBC Okanagan Daycare Building at 1262 Discovery Avenue. The facility will compliment the services of the Daycare building and provide 37 new childcare spaces consisting of 12 infant/toddler and 25 children aged 3–5 years.

The intent of this Electrical Design Brief is to describe the building electrical systems for the new Child Care Facility. This document provides electrical design systems descriptions for a better understanding of the design intent based on the owner's project requirements.

### 5.2 Utility Supply

The utility supply to the building will be provided by Fortis BC by means of the three-phase circuit located immediately south of the building. The primary voltage level of the electrical supply is 7,200/12,400V and will need to be transformed to the utilization voltage of 120/208V prior to entering the building. Transformation will be achieved by use of an exterior pad mounted transformer. The location of the transformer will be coordinated with Fortis BC and existing local underground services in the area, and if needed adjustments will be defined with the Campus Planning group.

CIMA has estimated the electrical load of the building to be 100kVA, however the final sizing of the transformer will be defined by Fortis BC.

### 5.3 Power Distribution

The incoming utility supply will enter the building underground and terminate on a 400A 120/208VAC 3 Phase 4 wire rated switchboard located in the M+E Room. The main breaker will be specified with an adjustable trip unit which will allow modification to the settings should the overall building load be modified in the future. The switchboard will contain an integral hydro cabinet and distribution section reducing overall space requirements needed in the M+E Room.

All 3-phase mechanical loads will be fed directly from the switchboard with a separate 225A 120/208V 3P 4W panelboard located within the same room supplying all lighting and plug loads.

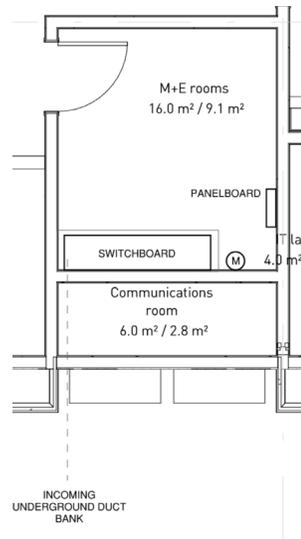


Figure 1.1 : Proposed M+E Room Layout

## 5.4 Lighting and Controls

Lighting will be achieved with the use of energy efficient LED fixtures for both interior and exterior building lighting. The lighting design will be coordinated with the architectural vision and attempt to compliment the design. Exterior fixtures to be selected that have similar appearance to adjacent buildings to maintain a cohesive campus look.

Target illumination levels, colour temperature and controls selected will respect the requirements as listed in the UBCO Design Guidelines. Refer to Appendix A for a markup of the proposed lighting layout and Appendix B for sample product cut sheets.

### 5.4.1 Interior Lighting

Open areas will be illuminated by suspended LED direct/indirect linear fixtures that will direct light up into the structure and down towards the floor. The fixtures will be suspended between the trusses and mounted at the same level as the bottom chord. Refer to Appendix A for proposed fixture layout.

Rooms with hard or lay-in tile ceilings will be provisioned with surface or recessed 1x4 or 2x4 fixtures as required. Service and storage rooms will be supplied with linear strip lights complete with wire guards.

Fixtures selected for the kitchen areas will be suitable food preparation areas and be comprised of a wrap around lens

### 5.4.2 Exterior Lighting

Building mounted lights will consist of dark sky compliant, full cut-off wall packs that will have similar appearance to adjacent buildings. Recessed down lights will be utilized in canopies to illuminate the covered areas.

The correlated colour temperature (CCT) of the fixtures will be 3,000K with an average target of 20 lux at the primary entrance.

Pathway lighting and parking lot lighting will be provided as required and be in accordance with the requirements listed in the UBCO Design Guidelines.

### 5.4.3 Lighting Control

Interior lighting control will consist of the following elements:

- Vacancy sensors to be provided for all enclosed rooms which are to be programmed to manual on and auto off to automatically turn the lights off upon determination of a vacant space. Sensors will be specified with dual technology for improved control.
- Daylight sensors will be provided for fixtures in the open area adjacent to the windows along the front of the building. The sensors will be programmed to maintain a specific lighting level. Output of the controlled fixtures will be automatically adjusted throughout the day to maintain the target light levels and minimize energy consumption when natural light is present.
- Switches will be specified to provide dimming capability to provide the ability to reduce the light levels in spaces that require the functionality.

Exterior mounted fixtures, building and canopy mounted, will be controlled by a photocell and timeclock. This will enable the lighting to be controlled by a user set schedule or activate by means of the photocell when light levels are low and outside the programmed schedule.

## 5.5 Life Safety Systems

Life Safety Systems for the building will be comprised of a fire alarm system, emergency lighting and exit signage.

### 5.5.1 Fire Alarm System

The fire alarm system will be a single stage addressable fire alarm system complete with a main control panel, smoke and thermal detectors and combination horn-strobes for annunciation. The fire alarm system design will be in accordance with the requirements of the BC Building Code, Canadian Electrical Code and CAN/ULC S-524 Standard for Installation of Fire Alarm Systems.

The control panel will be located in the main vestibule entrance to the facility providing ease of access to firefighters in an emergency.

### 5.5.2 Emergency Lighting

Emergency lighting will be provided by the building lighting system through the use of UL listed automatic load relays on selected fixtures. The automatic load relay allows the emergency lighting in a space to be controlled along with the normal lighting while ensuring that the emergency lighting will be forced to full bright upon loss of normal power to the space.

Emergency power for the fixtures will be provided by an Emergency Lighting Inverter located in the M+E Room. The inverter will be sized to provide emergency lighting for the runtime duration as required by the BC Building Code for the building type.

### 5.5.3 Exit Signage

Exit signage will be comprised of edge-lit pictogram sign mounted on an aluminum extruded housing. The signs will be self powered and provide a minimum of 120 minutes run time after loss of power.

## 5.6 IT/Communications

A single 24 strand fibre optic connection will be provisioned from the existing junction box on Discovery Avenue. Routing of the cable through the existing conduit will be coordinated with the UBC IT Department as well as equipment, power and/or termination requirements in the Communications Room.

CIMA will investigate the feasibility of connecting to Third Party service providers through the existing Daycare facility. Follow up with the individual service providers and UBC IT Department to determine the requirements will be required.

# C

## Appendix C Proposed Lighting Layouts





# D

## Appendix D Lighting Cutsheets





Date: \_\_\_\_\_ Fixture: \_\_\_\_\_

QTY: \_\_\_\_\_ Project: \_\_\_\_\_



# Thinline Flat

## Suspended Direct | Direct-Indirect

Architectural luminaire. Contemporary design. 8" wide by 2" high. 2' to 8' length options. Direct and Direct-Indirect distribution. Multiple finishes. cULus Listed. Designed and manufactured in North America. 10 Year Warranty.

### Performance

<b>Model</b>	4000K	3500K	3000K
<b>Lm/W</b>	120 Lm/W	116 Lm/W	112 Lm/W



### Ordering Options

Model	Continuous Run	Direct Lumens/Ft	Indirect Lumens/Ft	CRI	Color Temp	Voltage
DTL FLT	CR _____ Min 2Ft - Available in 6in increments - Unibody up to 8Ft	D 250 D 500 D 750 D 1000 D _____ (custom up to 1200)	I 250 I 500 I 750 I 1000 I _____ (custom up to 1200)	80 90	27K 2700K 3K 3000K 35K 3500K 4K 4000K 5K 5000K BIOS BIOS (consult factory)	U 120/277V H 347V

DTL FLT						
---------	--	--	--	--	--	--

Direct Lens	Indirect Lens	Finish	Mounting	Driver	Controls
FR Frosted	FR Frosted CL Clear BATWING Batwing (contact factory)	GRY Grey WH White BLK Black CU Custom (consult factory)	AC Aircraft Cable (10Ft standard)	DIMOFF 0-10 1% DIMOFF LUTRON Lutron Ecosystem SR Philips SR DALI .1% ELDO (347 only 1-10 5%) ELDO	N None DMX SNS Philips SNS 300 w/BLD&Daylight Encelium CLM CLM LG LG Dongle BT Bluetooth Mesh EN Enlighted Integral

FR			AC		
----	--	--	----	--	--

Circuits	Accessories	Wiring	Wire Color	Wire Length	Canopy Color
1 1 Circuit 2 2 Circuits	N None 10kV 10kV Surge Protection EMBAT 6W 90 Min Battery	N None 5 WIRE 5 Wire 6 WIRE(NL) 6 Wire +GTD Generator Transfer Device	G Grey W White B Black C Clear	Length ____'	WH White BLK Black CU Custom

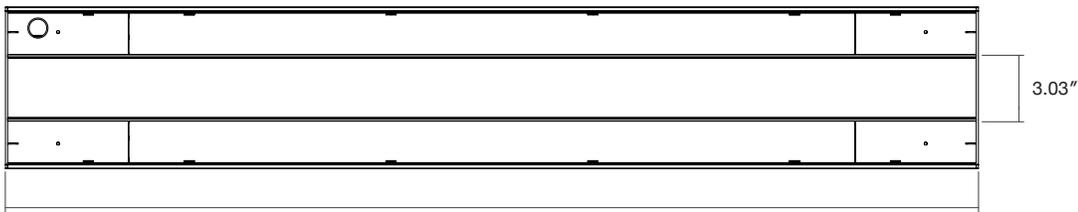
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Sample Configuration: DTL FLT - CR8 - D500 - I500 - 90 - 4K - U - FR - FR - GRY - AC - DIMOFF - N - 1 - N - N - G - 8 - WH

**LED**

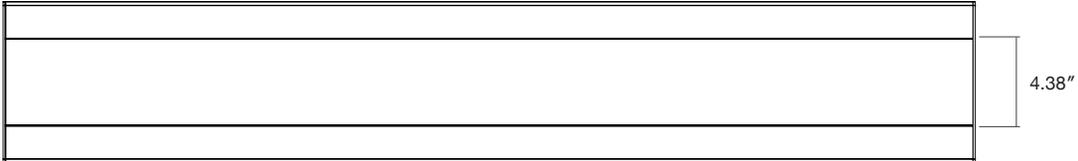
L90 > 70,000  
 Samsung 301 3 McAdam Binning  
 4000K 120 Lm/W  
 3500K 98%  
 3000K 96%  
 90 CRI 85%

**Dimensions**

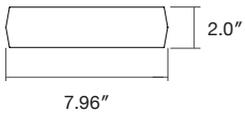


2': 24.2" 3': 36.2" 4': 48.2" 5': 60.2" 6': 72.2" 7': 84.2" 8': 96.2"  
 Actual Length = NOMINAL +.2"

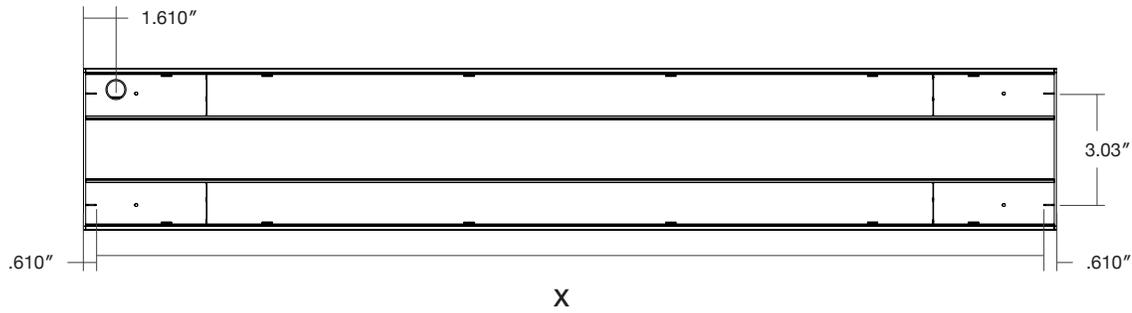
Top



Bottom



## Mounting



### Mounting Lengths - X

Models	Lengths
DTL FLT 2	23"
DTL FLT 3	35"
DTL FLT 4	47"
DTL FLT 5	59"
DTL FLT 6	71"
DTL FLT 7	83"
DTL FLT 8	95"

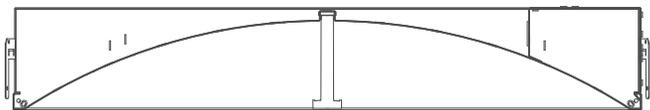
# FLUXWERX®

## SPECIFICATION DATA TRANSOM 2x4 (TR124)

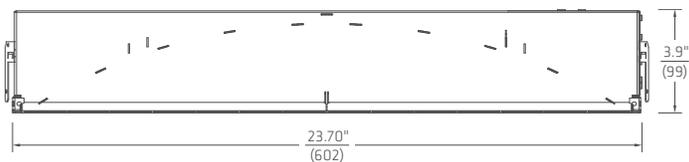


100% Dn

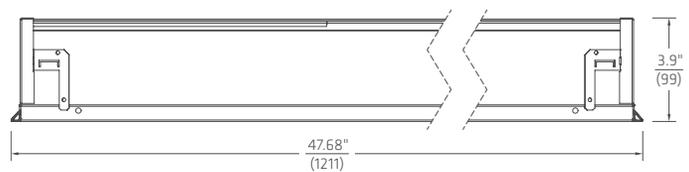
### CROSS SECTION



### DIMENSIONS



FRONT VIEW



SIDE VIEW

### CATALOG #

### PROJECT

### NOTES

### PERFORMANCE FOCUS

#### 80 CRI 4000 K (TR124x40)

	Energy (W)	Light (lm)	Efficacy (lm/W)
A	23 W	2750	119
B	29 W	3300	117
C	38 W	4300	112
D	47 W	5000	109

Color Matching (SDCM)	Lumen Maintenance (hr)	
	L90 per TM21	L70 Estimate
< 2	> 60,000	> 200,000

*Nominal values, refer to back pages for full performance data.*

### FEATURES

- Luminous, transparent vertical lens is framed by a clear anodized aluminum rail.
- Innovative Anidolic optics produce a visually comfortable, controlled optical distribution.
- Priced for a wide range of real-world projects.
- Available in five sizes – 2x2, 1x4, 2x4, 20"×2 and 20"×4 – to suit a variety of applications and spaces.
- Up to 10' x 10' spacing, capable of delivering close to 40 fc at less than 0.4 W/ft<sup>2</sup>.
- Suitable for both T-Grid and drywall ceilings, using optional Trim or Trimless flange kits.



## ORDER GUIDE

1	2	3	4	5	6	OPTIONS	CONTROLS
<b>TR1</b>	<b>24</b>						

1 FAMILY	2 SIZE	3 ENERGY <sup>2</sup>	4 CRI-CCT	5 DRIVER
<b>TR1</b> Transom	<b>14</b> 1 x 4	<b>A</b> 23 W	<b>30</b> 80 CRI 3000 K	<b>F1</b> Non-Dim
	<b>22</b> 2 x 2	<b>B</b> 29 W	<b>35</b> 80 CRI 3500 K	<b>F2</b> 0-10 V Dim 3%
	<b>▶24</b> 2 x 4	<b>C</b> 38 W	<b>40</b> 80 CRI 4000 K	<b>E1</b> eldoLED ECO 0-10 V Dim 1%
	<b>52</b> 20" x 24"	<b>D</b> 47 W <sup>3</sup>	<b>93</b> 90 CRI 3000 K	<b>E2</b> eldoLED SOLO 0-10 V Dim 0.1%
	<b>54</b> 20" x 48" <sup>1</sup>		<b>90</b> 90 CRI 3500 K	<b>E3</b> eldoLED ECO DALI Dim 1%
			<b>94</b> 90 CRI 4000 K	<b>E4</b> eldoLED SOLO DALI Dim 0.1%
				<b>L1</b> Lutron Hi-Lume 1% EcoSystem (LDE1)
				<b>L2</b> Lutron Hi-Lume 1% 2-Wire 120 V (LTEA)
	<sup>1</sup> Optional filler panels available for 20 x 60.	<sup>2</sup> Nominal input power. Add 4 W for 347 V with E1-4/L1.	<sup>3</sup> 1 x 4   2 x 4   20 x 48 only.	

6 VOLTAGE	OPTIONS <sup>5</sup>	CONTROLS
<b>M</b> 120-277 V	<b>B</b> Battery Pack	<b>RE1</b> Remote Enlighted Smart Sensor
<b>3</b> 347 V <sup>4</sup>	<b>C</b> Chicago Plenum	<b>VN1</b> Acuity nLight Converter
	<b>F</b> 6' Flex Whip	
	<b>H</b> Emergency Switching (GTD or Controller)	
	<b>K1</b> Drywall Flange Kit - Trim	
	<b>K2</b> Drywall Flange Kit - Trimless	
<sup>4</sup> 347 V Driver for F1/F2, 347 V Transformer & Driver for E1-4/L1.	<sup>5</sup> BP & GTD available for 120-277 V.	

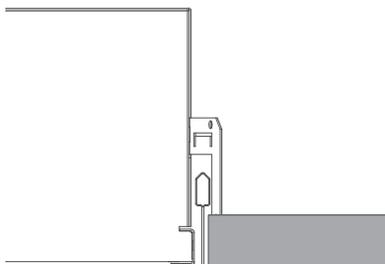
**PRODUCT DETAILS**



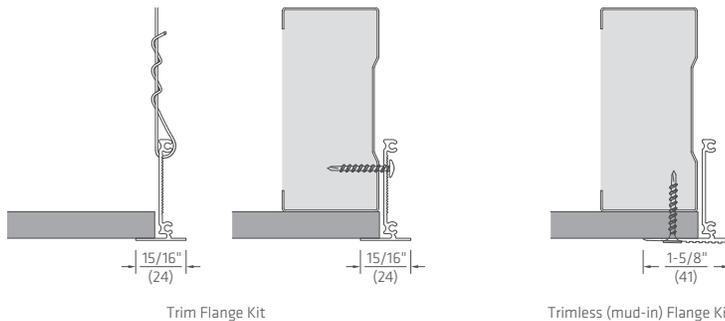
LINEAR ANIDOLIC OPTIC

**CEILING INTEGRATION**

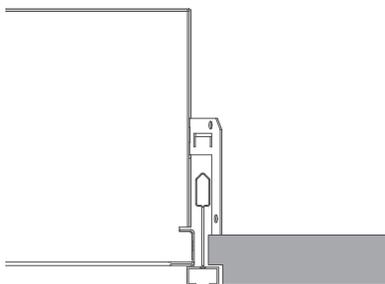
FLAT GRID



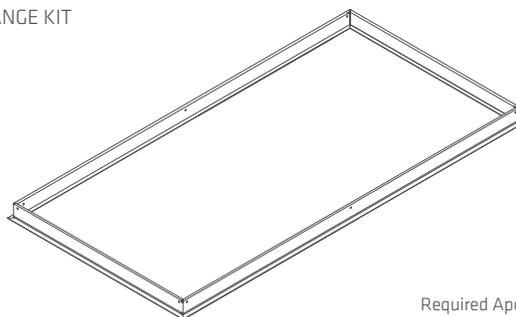
DRYWALL



SLOT GRID



DRYWALL FLANGE KIT



Required Aperture:  $\frac{24.5}{622} \times \frac{48.5}{1232}$

## SPECIFICATION DATA

### TRANSOM 2x4 (TR124)

#### NOTES

##### CONSTRUCTION

- Clear anodized aluminum lower rail
- Formed 22 ga. steel housing
- Quick wire access plate and integral seismic restraint tabs/tie-offs
- Optional drywall trim or trimless (mud-in) flange kits
- High reflectance diffuse white textured powdercoat

##### OPTICAL

- Anidolic optical structures with linear light extraction elements
- Precision molded high transmittance clear acrylic lenses
- Long life LED system designed for typical TM21 lumen maintenance  $\geq$  L90 @ 60,000 h
- Available in 3000K, 3500K, 4000K with CRI  $\geq$  80 and R9  $\geq$  0, or CRI  $\geq$  90 and R9  $\geq$  50, all with color accurate binning  $\leq$  2 SDCM

##### ELECTRICAL

- Integral high efficiency drivers for 50–60Hz, 120–277V or 347V
- Power Factor  $>$  0.90
- Total Harmonic Distortion  $<$  20%
- Dim level: Standard 3%, optional 1% or 0.1%
- Optional Battery Pack delivers 10 W Class 2 rated output for 90 min. Use 12 W input energy to estimate emergency flux, typically 1150–1750 lm (@ 100–150 lm/W).
- Optional GTD (Generator Transfer Switch), 120–277V, disables 0–10 V control during emergency for full light output
- Optional flex whip: 6' prewired
- Surge Protection: Meets ANSI C82.11 spec and ANSI/IEEE C62.41
- Inrush Current: Meets NEMA 410

##### ENVIRONMENTAL & CARE

- Designed for use in dry or damp indoor locations with ambient temperatures of 0–30° C (32–86° F)
- Not suitable for natatorium environments, e.g. swimming pools, hot tubs and saunas. The luminaire may be damaged by chemicals such as chlorine, solvents, ammonia, alcohol or sulfur in the area of operation or in cleaning products. Damage from contaminants is not covered under warranty.
- Clean only by wiping with a slightly water-damp, soft, clean cloth.

##### WEIGHT

- Maximum 27 lbs (12.3 kg) with standard driver
- Maximum 31 lbs (14.1 kg) with battery pack or 347 V transformer

##### WARRANTY

- 5 year limited warranty on all components and workmanship

##### INDEPENDENT TESTING

- IESNA LM79
- IESNA LM80 (LED @ 9,000 or 10,000 h)

##### APPROVALS

- UL Listed (USA + Canada)
- CCEA Chicago Plenum
- IC Rated

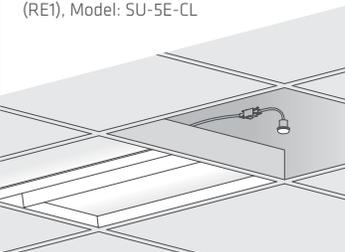
Protected by one or more US patents: 10215344, 10830415, 9733411, 9823406, D698973; EU patents: 002260752-0001, 002260752-0002, 002260752-0003.

#### CONTROLS & SENSORS

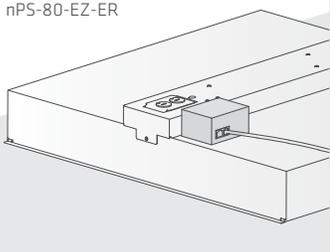
Fluxwerx products are designed for simple integration with a wide range of sensors, lighting controls and building management systems. Many projects incorporate occupancy sensing, daylight harvesting, individual or central adjustment of light levels and luminaire or space monitoring in order to save energy, reduce costs and maximize occupant comfort. Fluxwerx offers a number of standard driver and controller options to support various wired and wireless network protocols.



Enlighted wireless, networked smart sensor integrates occupancy sensing, daylight harvesting, energy usage, temperature and light level control. Option: Remote Enlighted sensor (RE1), Model: SU-5E-CL




nLight wired, 2-way network supports luminaire light level control as well as occupancy and daylight sensors. Option: Acuity nLight Converter (VN1), Model: nPS-80-EZ or nPS-80-EZ-ER




EldoLED drivers support common wired protocols, 0–10 V and DALI. They also provide access to finer dimming control, dynamic white and Bluetooth low-energy (BLE) wireless. Options: ECO 1% (E1), SOLO 0.1% (E2)



Lutron EcoSystem network protocol enables on/off, dimming, occupancy sensing and daylight harvesting. Option: Hi-Lume 1% EcoSystem (L1), Model: LDE1



## SPECIFICATION DATA

### TRANSOM 2x4 (TR124)

#### FAMILY PERFORMANCE

##### 80 CRI

COLOR	4000 K	3500 K	3000 K
Color Rendering (CRI)	83	83	82
Red Index (R9)	9	9	5
Color Matching (SDCM)	< 2		

##### 90 CRI

COLOR	4000 K	3500 K	3000 K
Color Rendering (CRI)	92	92	92
Red Index (R9)	63	63	59
Color Matching (SDCM)	< 2		

LUMEN MAINTENANCE	A 23 W	B 29 W	C 38 W	D 47 W
L90 per TM-21 (hr)	> 60,000			
L70 Estimate (hr)	> 200,000			

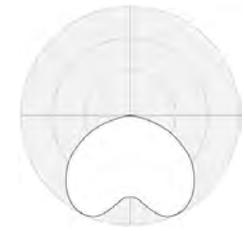
BATTERY OUTPUT - 80 CRI	4000 K	3500 K	3000 K
10 W BP Light (Est. lm)	1420	1390	1360

90 CRI OUTPUT	4000 K	3500 K	3000 K
90 CRI Multiplier	0.84	0.84	0.84

For Light (lm), Intensity (Cd) or Luminance (Cd/m<sup>2</sup>) in 90 CRI, multiply 80 CRI values by the 90 CRI Multiplier for chosen CCT.

#### VERSION PERFORMANCE

##### 80 CRI, 100% Down

CCT	CONFIGURATION		LIGHT & POWER			VISUAL COMFORT		LIGHT DISTRIBUTION
	A	ENERGY (NOM.)	LIGHT (lm)	POWER (W)	EFFICACY (lm/W)	MAX INTENSITY 45-90° (Cd)	MAX LUMINANCE 45-90° (Cd/m <sup>2</sup> )	
TR124x40 4000 K	A	23 W	2744	23.16	118.5	716	1,539	 <p>Transom Recessed 100% Dn</p>
	B	29 W	3323	28.52	116.5	867	1,864	
	C	38 W	4301	38.37	112.1	1,122	2,413	
	D	47 W	5001	46.01	108.7	1,305	2,805	
TR124x35 3500 K	A	23 W	2692	23.16	116.2	702	1,510	
	B	29 W	3260	28.52	114.3	850	1,829	
	C	38 W	4220	38.37	110.0	1,101	2,367	
	D	47 W	4907	46.01	106.6	1,280	2,752	
TR124x30 3000 K	A	23 W	2640	23.16	114.0	689	1,481	
	B	29 W	3172	28.48	111.4	827	1,779	
	C	38 W	4139	38.37	107.9	1,080	2,321	
	D	47 W	4812	46.33	103.9	1,255	2,699	

##### Photometry Reports: 11361637.25 (38 W), 11555052.16 (47 W)

Integrating Sphere and Photometric results at 4000K, 3500K and 3000K scaled from TR124 47W (D) and TR114 results from an independent accredited testing laboratory per IES LM-79-2008 and ANSI C78.377-2011. Candlepower Distribution scaled per total lumens of Integrating Sphere results.

# ENVIROSEAL™

## Food Processing Luminaires

### FES SERIES

#### PRODUCT FEATURES:

- » Ceiling or wall mount – 8"×24", 8"×36", 8"×48", 8"×96"
- » One-piece 20-gauge housing with UV-stabilized polycarbonate lens
- » IP65 option available
- » For Hazardous applications please refer to the HES series



#### PROJECT INFORMATION

Job Name \_\_\_\_\_

Fixture Type \_\_\_\_\_

Catalog Number \_\_\_\_\_

Approved by \_\_\_\_\_

#### SPECIFICATIONS:

**HOUSING:** One-piece, seam-welded 20-gauge CRS. Base provided with two-point mounting holes and one wireway hole. Lens is positioned in base-plate channels and retained with stainless steel fastener(s). Base mounts flush to ceiling or wall surface.

**LENS/GASKET:** UV-stabilized, pearlescent or clear polycarbonate. Smooth exterior, linear prismatic interior. Nominal thickness .125". Linear silicone gasket to seal doorframe to housing.

**FINISH:** Brushed stainless steel finish (#4B) or white TGIC polyester powder coat – 5-stage pre-treatment; Salt spray test: 1,000 hours; Reflectance: 92%.

**SOCKETS:** Shock-resistant sockets with internal locking collar to ensure positive lamp retention.

**HARDWARE:** Two Type 302 stainless steel Phillips head fasteners secure lens in housing channel.

**ELECTRICAL:** LED; Available 3000K, 3500K, 4000K and 5000K color temperatures, 82 CRI. 120-277VAC or 347VAC, 50/60Hz electrical input with serviceable high power factor electronic, constant-current driver (<20% THD, >0.95 PF). Standard 0-10V dimming with 1-100% range and dim-to-dark capabilities (non dim-to-dark with 347V); 330 µA max. source current. LF: Class P ballast. Fluorescent electronic 120/277 or 347 voltage ballasts, high power factor. Optional one-lamp 90 minute nickel-cadmium battery pack (EL) includes inverter charger, test switch and charging indicator lamp.

**SENSOR & CONTROLS:** Optional sensor available with compatible third party controls. To see the full list of compatible controls, [click here](#).

**PHOTOMETRICS:** Photometry tested to the IESNA LM-79-08 standard by an ILAC/ISO17025 accredited laboratory. For additional photometric data, please go to [www.kenall.com](http://www.kenall.com).

**WARRANTY:** Limited five (5) year LED warranty. [Peace of Mind Guarantee against breakage](#).

**LISTINGS:** UL and CUL listed for Wet Location – ceiling mount covered ceiling. UL and CUL listed for Damp Location – horizontal wall mount. Optional UL certified IP65 per IEC 60598 (IP65 Option) – ceiling mount. NSF2 Splash/Non-Food Zone listed. Rated for use in FED-STD 209E/Class 1 (ISO 3) Cleanrooms.



#### ORDERING INFORMATION (Ex: FES8-48-45L50K-DCC-1-DV-2H-PP-FS)

Model	Length	Lamp Qty/Type	Ballast/Driver Type	Ballast/Driver Qty	Voltage	Housing	Lens Type	Options	
<b>FES8</b>									
<b>Nominal Length</b>			<b>8' Lengths (Lamp Qty per 4' Cross Section)</b>		<b>Voltage</b>			<b>Options</b>	
24	2'		1-45L30K	45 Watt 3000K LED	DV	120-277 Volts		LEL^	LED Emergency Battery Backup (45L Lamp Type Only)
36	3'		1-45L35K	45 Watt 3500K LED	347	347 Volt		EL*‡	Standard Lumen EL Pack (450 lumens) (n/a LED)
48	4'		1-45L40K	45 Watt 4000K LED				PEL*‡	High Lumen EL Pack (1100 lumens) (n/a LED)
96	8'		1-45L50K	45 Watt 5000K LED				SEL*‡	Specified EL Pack (n/a LED)
<b>Lamp Qty/Type</b>			1-67L30K	67 Watt 3000K LED	<b>Housing Options</b>			FS	Single Fuse & Holder (n/a with 347V)
2'			1-67L35K	67 Watt 3500K LED	2H	20-Ga CRS; Painted		HC^	Row Mount Hub Connector (see KO option)
2-14^	F14T5		1-67L40K	67 Watt 4000K LED	P5H	20-Ga 304SS; Painted		KO^	Continuous Row Mount - .875" diameter knockout in end caps (see HC option for Kenall supplied attachment connector)
2-17	F17T8		1-67L50K	67 Watt 5000K LED	5H	20-Ga 304SS; Brushed		PM^†	Pendant Mount (damp locations only) suspension hardware by others
<b>3' Lengths</b>			1-90L30K	90 Watt 3000K LED	PXH	20-Ga 316SS; Painted		TN120	120 Volt, 13 Watt Twin Tube NPF Night Light (n/a LED)
2-21	F21T5		1-90L35K	90 Watt 3500K LED	XH	20-Ga 316SS; Brushed		TN277	277 Volt, 13 Watt Twin Tube NPF Night Light (n/a LED)
2-25	F25T8		1-90L40K	90 Watt 4000K LED				IP65***	UL certified IP65 Listing (Ceiling Mount)
<b>4' Lengths</b>			2-28^	F28T5	<b>Lens Type</b>			TR	Tamper Resistant Torx with center pin fastener
1-45L30K	45 Watt 3000K LED		2-32	F32T8	PP	Pearlescent Polycarbonate			
1-45L35K	45 Watt 3500K LED		2-54	F54T5HO	CP*	Clear Polycarbonate			
1-45L40K	45 Watt 4000K LED								
1-45L50K	45 Watt 5000K LED		<b>Ballast/Driver Type</b>						
1-67L30K	67 Watt 3000K LED		DCC	Dimming Constant Current					
1-67L35K	67 Watt 3500K LED		IS	Elec <10% THD Instant Start (T8)					
1-67L40K	67 Watt 4000K LED		RS	Elec <10% THD Rapid Start (T5, T5HO, T8)					
1-67L50K	67 Watt 5000K LED		SB	Specified Ballast					
1-90L30K	90 Watt 3000K LED								
1-90L35K	90 Watt 3500K LED		<b>Ballast/Driver Quantity</b>						
1-90L40K	90 Watt 4000K LED		1	One					
1-90L50K	90 Watt 5000K LED		2	Two					
2-28^	F28T5								
2-32	F32T8								
2-54	F54T5HO								



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**ENVIROSEAL™**  
Food Processing Luminaires

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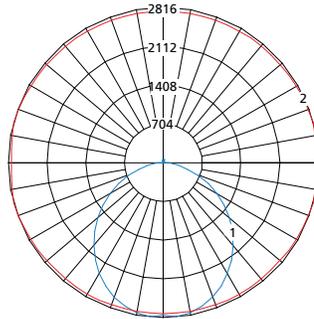
**FES SERIES**

**PERFORMANCE**

Lamp Type	Initial Delivered Lumens		Input Power (W)	Drive Current (mA)	Estd. L70 LED Life (hrs)
	@ 25°C (lm)	Efficacy (lm/W)			
45L30K	4,819	98	49	100	80,000
45L35K	4,968	101			
45L40K	5,138	105			
45L50K	5,273	108			
67L30K	7,373	101	73	75	80,000
67L35K	7,601	104			
67L40K	7,860	108			
67L50K	8,067	111			
90L30K	9,366	97	97	100	60,000
90L35K	9,655	100			
90L40K	9,985	103			
90L50K	10,248	106			

Displayed information above is for PP lens type. Info subject to change. Visit [www.kenall.com](http://www.kenall.com) for IES files and additional information.

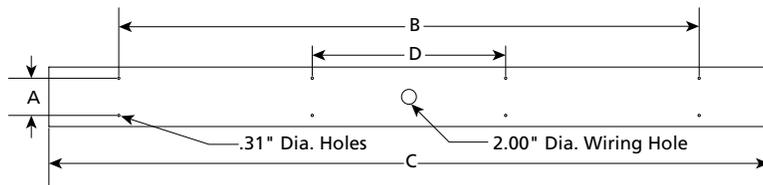
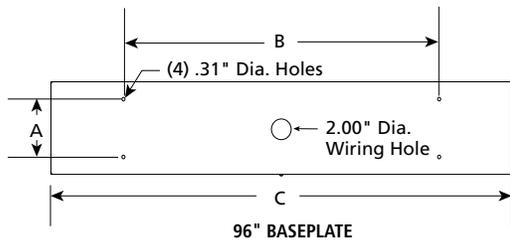
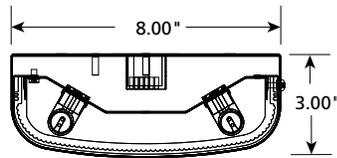
Model: FES8-48-67L40K-DCC-DV-2H-PP



Max Candela = 2816 Located At Horizontal Angle = 15, Vertical Angle = 5

- 1 - Vertical Plane Through Horizontal Angles (15 - 195) (Through Max. Cd.)
- 2 - Horizontal Cone Through Vertical Angle (5) (Through Max. Cd.)

**DIMENSIONAL DATA**



**DIMENSIONAL DATA (IN INCHES)**

	A	B	C	D
FES824 – T5	5.00	16.00	23.13	
FES824 – T8	5.00	16.00	24.75	
FES836 – T5	5.00	20.00	35.00	
FES836 – T8	5.00	20.00	36.75	
FES848 – T5	5.00	32.00	46.75	
FES848 – T8/LED	5.00	32.00	48.75	
FES896 – T5	5.00	78.00	92.87	26.00
FES896 – T8	5.00	78.00	96.78	26.00



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Catalog Number
Notes
Type

Contractor Select™

# CSS

## LED Strip Light

The light-duty, dimmable, damp-location and DLC® listed CSS LED strip light can easily mount individually to a ceiling, horizontal and vertical wall, or by continuous row. The size and versatility makes it suitable for tight spaces, task lighting, restrooms, under/over cabinet and storage closets.

**FEATURES:**

- Inspired by classic fluorescent strip channels, this LED fixture offers a traditional appearance that incorporates the latest technology
- Quick and simple to install with the snap-lock tool-less channel cover
- Features a low-glare diffuse lens for enhanced aesthetic



Catalog Number	UPC	Description	Lumens	Wattage	Voltage	Color Temperature	Color Rendering Index	Pallet Quantity
CSS L48 4000LM MVOLT 40K 80CRI	00193048852622	4' MVOLT LED Strip Light	4298	35.3	MVOLT (120-277)	4000K	80CRI	98
CSS L96 8000LM MVOLT 40K 80CRI	00193048852721	8' MVOLT LED Strip Light	8596	72	MVOLT (120-277)	4000K	80CRI	102
CSS L48 ALO3 MVOLT SWW3 80CRI	00193048852677	4' MVOLT Switchable LED Strip Light	3247-5150	28, 36, 44	MVOLT (120-277)	35K/40K/50K	80CRI	98
CSS L96 ALO4 MVOLT SWW3 80CRI	00193048852738	8' MVOLT Switchable LED Strip Light	6495-10300	55, 72, 88	MVOLT (120-277)	35K/40K/50K	80CRI	102

More configurations are available. [Click here](#) or visit [www.acuitybrands.com](http://www.acuitybrands.com) and search for CSS LED.

Accessories: Order as separate catalog number.	
HC36 M12	Chain hanger and jack chain, 36" (pair)
ZACVH	Aircraft cable 10' (one pair)
SQ	5/8" Swivel-stem hanger (specify length in 2" increments up to 48")
Y J10	Y hanger in multiples of 10 (five pair)
WGCSS	Wireguard with Mounting hardware (one 4ft)
MNLK JBOXCVR M12	Junction box cover with hardware, white



## Specifications

### INTENDED USE:

Inspired by classic fluorescent strip channels, this LED fixture offers a traditional appearance that incorporates the latest technology. Available in several color temperatures, lumen packages and lengths. Ideal for use in commercial, retail, office, warehouse and display applications. **Certain airborne contaminants can diminish integrity of acrylic.** [Click here for Acrylic Environmental Compatibility table for suitable uses.](#)

Certain airborne contaminants may adversely affect the functioning of LEDs and other electronic components, depending on various factors such as concentrations of the contaminants, ventilation, and temperature at the end-user location. [Click here for a list of substances that may not be suitable for interaction with LEDs and other electronic components.](#)

### CONSTRUCTION:

Compact-design channel and cover are formed from code-gauge, cold-rolled steel.

Easy to install row aligner bracket included for continuous row mounting.

Finish: High-gloss, baked white enamel (standard).

### OPTICS:

LEDs provide 80+ color rendering index (CRI) at 3500 K, 4000 K and 5000 K. Diffuse acrylic lens provides smooth, linear illumination. Lumen output exceeds 1,000 lumens per foot.

### ELECTRICAL:

Luminaire Surge Protection Level: Designed to withstand up to 2.5kV/0.75kA per ANSI C82.77-5-2015. For applications requiring higher level of protection additional surge protection must be provided. Driver is standard 0-10V dimming class 2.

### INSTALLATION:

Fixture may be surface or suspension mounted with appropriate mounting options (see accessories). Aligner locks in place for easy continuous row mounting.

### LISTINGS:

CSA certified to US and Canadian safety standards and listed suitable for damp locations.

Minimum starting temperature at -40°F (-40°C). Maximum ambient operating temperature of 95°F (35°C).

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at [www.designlights.org/QPL](http://www.designlights.org/QPL) to confirm which versions are qualified.

### WARRANTY:

5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at:

[www.acuitybrands.com/support/warranty/terms-and-conditions](http://www.acuitybrands.com/support/warranty/terms-and-conditions)

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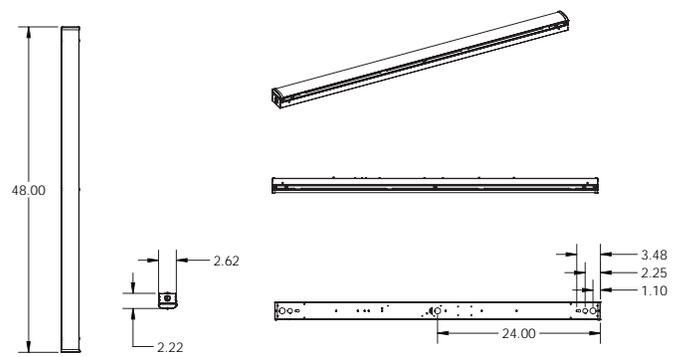
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Specifications subject to change without notice.

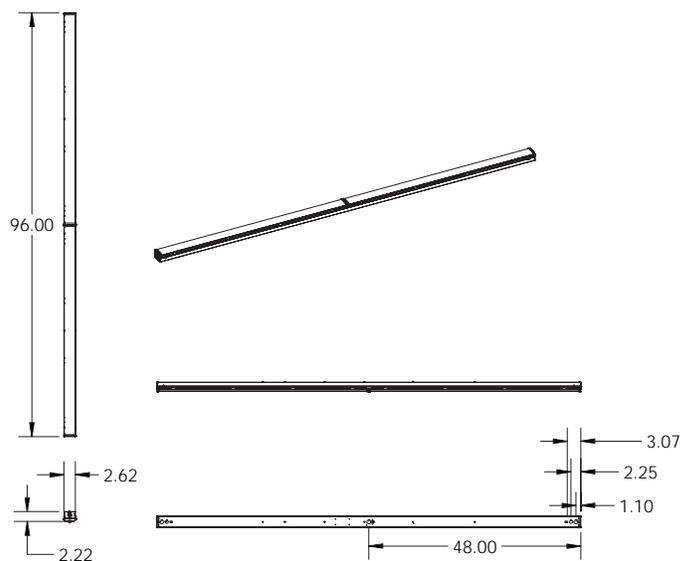
## Dimensions

All dimensions are inches (centimeters) unless otherwise indicated.

### 4FT ASSEMBLY



### 8FT ASSEMBLY





Catalog Number
Notes
Type

Contractor Select™  
**Lithonia LDN**  
 LED Commercial Downlight

LDN 6" downlights are the most cost-effective general illumination solutions for commercial-grade downlight applications. The LDN4 and LDN6 designs allow for a quiet, glare-free ceiling without compromising on efficacy.

**FEATURES:**

- 55° cutoff
- 80-90 Lumens/Watt
- 1.0 Spacing/Mounting Height ratio
- Open wallwash kicker also available
- MVOLT (120-277V) 0-10V 10% dimming
- Available in 1000lm, 1500lm, or 2000lm



Catalog Number	UPC	Description	Replaces Up To	Lumens	Input Watts	CCT	CRI	Voltage	Pallet qty.
LDN6 35/10 MVOLT GZ10 HSG	00193048377323	6" New Construction Non-IC LED Housing, 1000lm, 10% 0-10V dimming	26W CFL	1,000	11W	3500K	80	120-277	84
LDN6 35/15 MVOLT GZ10 HSG	00193048375787	6" New Construction Non-IC LED Housing, 1500lm, 10% 0-10V dimming	32W CFL	1,500	18W	3500K	80	120-277	84
LDN6 35/20 MVOLT GZ10 HSG	00193048380026	6" New Construction Non-IC LED Housing, 2000lm, 10% 0-10V dimming	42W CFL	2,000	22W	3500K	80	120-277	84
LDN4 35/10 MVOLT GZ10 HSG	00193048378481	4" New Construction Non-IC LED Housing, 1000lm, 10% 0-10V dimming	26W CFL	1,000	11W	3500K	80	120-277	84
LDN4 35/15 MVOLT GZ10 HSG	00193048372816	4" New Construction Non-IC LED Housing, 1500lm, 10% 0-10V dimming	32W CFL	1,500	18W	3500K	80	120-277	84
LDN4 35/20 MVOLT GZ10 HSG	00193048377873	4" New Construction Non-IC LED Housing, 2000lm, 10% 0-10V dimming	42W CFL	2,000	22W	3500K	80	120-277	84
L06AR LSS TRIM	00745972691619	6" Open reflector with clear, semi-specular finish							180
LW6AR LSS TRIM	00190887157093	6" Open wallwash with clear, semi-specular finish							180
L04AR LSS TRIM	00745972691343	4" Open reflector with clear, semi-specular finish							180
LW4AR LSS TRIM	00190887165678	4" Open wallwash with clear, semi-specular finish							180

More configurations are available. [Click here](#) or visit [www.acuitybrands.com](http://www.acuitybrands.com) and search for LDN

<b>Accessories:</b> Order as separate catalog number.	
PS1055CP	FMC Power Sentry battery pack, T20 compliant, field installable, 10w constant power
<a href="#">EAC ISSM 375</a>	Compact interruptible emergency AC power system
<a href="#">EAC ISSM 125</a>	Compact interruptible emergency AC power system
GRA68 JZ	Oversized trim ring with 8" outside diameter

<b>Emergency Battery Delivered Lumens</b>
Use the formula below to determine the delivered lumens in emergency mode
<b>Delivered Lumens = 1.25 x P x LPW</b>
P = Output power of emergency driver (10W for PS1055)
LPW = Lumen per watt rating of the luminaire.



## Specifications

### INTENDED USE:

Typical applications include corridors, lobbies, conference rooms and private offices.

### CONSTRUCTION:

Galvanized steel mounting/plaster frame; galvanized steel junction box with bottom-hinged access covers and spring latches.

Reflectors are retained by torsion springs.

Vertically adjustable mounting brackets with commercial bar hangers provide 3-3/4" total adjustment.

Two combination 1/2"-3/4" and four 1/2" knockouts for straight-through conduit runs. Capacity: 8 (4 in, 4 out). No. 12 AWG conductors, rated for 90°C.

Accommodates 12"-24" joist spacing.

Passive cooling thermal management for 25°C ambient

Light engine and drivers are accessible from above or below ceiling.

Max ceiling thickness 1-1/2".

### OPTICS:

LEDs are binned to a 3-step SDCM; 80 CRI minimum.

LED light source concealed with diffusing optical lens.

General illumination lighting with 1.0 S/MH and 55° cutoff to source and source image.

Self-flanged anodized reflectors in semi-specular finish.

### ELECTRICAL:

Multi-volt (120-277V, 50/60Hz) 0-10V dimming drivers mounted to junction box, 10% minimum dimming level available.

0-10V dimming fixture requires two (2) additional low-voltage wires to be pulled.

70% lumen maintenance at 60,000 hours.

### LISTINGS:

Certified to US and Canadian safety standards. Wet location standard (covered ceiling).

IP55 rated. ENERGY STAR® certified product. More configurations are available. Click here or visit [www.acuitybrands.com](http://www.acuitybrands.com) and search for LDN.

### WARRANTY:

5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at:

[www.acuitybrands.com/support/warranty/terms-and-conditions](http://www.acuitybrands.com/support/warranty/terms-and-conditions)

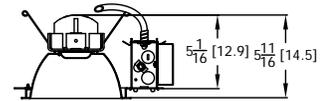
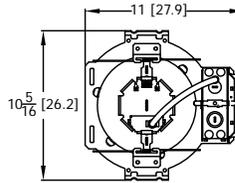
**Note:** Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

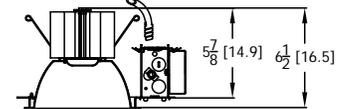
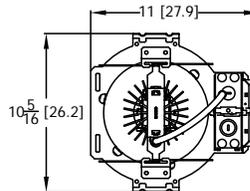
## Dimensions

### LDN6 500-1500 LUMEN



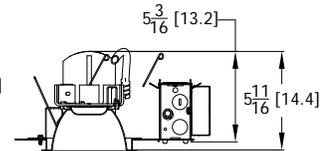
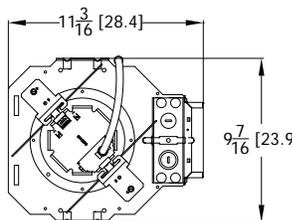
Aperture: 6-1/4 (15.9)  
Ceiling Opening: 7-1/8 (18.1)  
Overlap trim: 7-1/2 (19.1)

### LDN6 2000 LUMEN



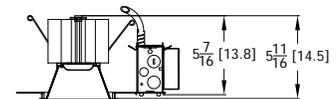
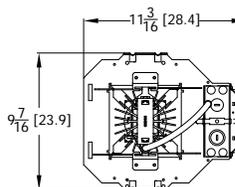
Aperture: 6-1/4 (15.9)  
Ceiling Opening: 7-1/8 (18.1)  
Overlap trim: 7-1/2 (19.1)

### LDN4 500-1500 LUMEN



Aperture: 4-5/16 (11)  
Ceiling Opening: 5-1/8 (13)  
Overlap trim: 5-7/16 (13.8)

### LDN4 2000 LUMEN



Aperture: 4-5/16 (11) Square  
Ceiling Opening: 5-1/8 (13) Square  
Overlap trim: 5-7/16 (13.8) Square

All dimensions are inches (centimeters) unless otherwise indicated.



Catalog Number
Notes
Type

Contractor Select™

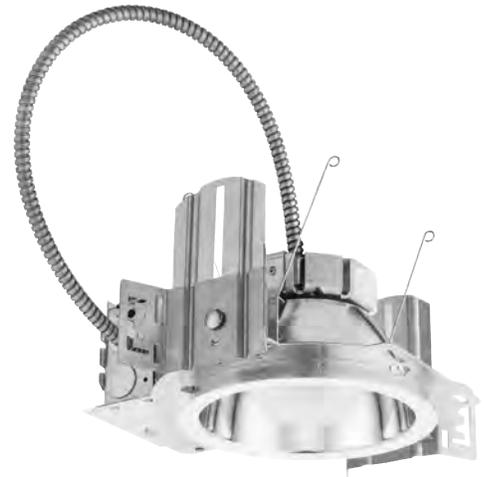
# Lithonia LDN

## LED Commercial Downlight

LDN 6" downlights are the most cost-effective general illumination solutions for commercial-grade downlight applications. The LDN4 and LDN6 designs allow for a quiet, glare-free ceiling without compromising on efficacy.

**FEATURES:**

- 55° cutoff
- 80-90 Lumens/Watt
- 1.0 Spacing/Mounting Height ratio
- Open wallwash kicker also available
- MVOLT (120-277V) 0-10V 10% dimming
- Available in 1000lm, 1500lm, or 2000lm



Catalog Number	UPC	Description	Replaces Up To	Lumens	Input Watts	CCT	CRI	Voltage	Pallet qty.
LDN6 35/10 MVOLT GZ10 HSG	00193048377323	6" New Construction Non-IC LED Housing, 1000lm, 10% 0-10V dimming	26W CFL	1,000	11W	3500K	80	120-277	84
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LDN6 35/20 MVOLT GZ10 HSG	00193048380026	6" New Construction Non-IC LED Housing, 2000lm, 10% 0-10V dimming	42W CFL	2,000	22W	3500K	80	120-277	84
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LDN4 35/15 MVOLT GZ10 HSG	00193048372816	4" New Construction Non-IC LED Housing, 1500lm, 10% 0-10V dimming	32W CFL	1,500	18W	3500K	80	120-277	84
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L06AR LSS TRIM	00745972691619	6" Open reflector with clear, semi-specular finish							180
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LW4AR LSS TRIM	00190887165678	4" Open wallwash with clear, semi-specular finish							180

More configurations are available. [Click here](#) or visit [www.acuitybrands.com](http://www.acuitybrands.com) and search for LDN

<b>Accessories:</b> Order as separate catalog number.	
PS1055CP	FMC Power Sentry battery pack, T20 compliant, field installable, 10w constant power
<a href="#">EAC ISSM 375</a>	Compact interruptible emergency AC power system
<a href="#">EAC ISSM 125</a>	Compact interruptible emergency AC power system
GRA68 JZ	Oversized trim ring with 8" outside diameter

<b>Emergency Battery Delivered Lumens</b>
Use the formula below to determine the delivered lumens in emergency mode
<b>Delivered Lumens = 1.25 x P x LPW</b>
P = Output power of emergency driver (10W for PS1055)
LPW = Lumen per watt rating of the luminaire.



## Specifications

### INTENDED USE:

Typical applications include corridors, lobbies, conference rooms and private offices.

### CONSTRUCTION:

Galvanized steel mounting/plaster frame; galvanized steel junction box with bottom-hinged access covers and spring latches.

Reflectors are retained by torsion springs.

Vertically adjustable mounting brackets with commercial bar hangers provide 3-3/4" total adjustment.

Two combination 1/2"-3/4" and four 1/2" knockouts for straight-through conduit runs. Capacity: 8 (4 in, 4 out). No. 12 AWG conductors, rated for 90°C.

Accommodates 12"-24" joist spacing.

Passive cooling thermal management for 25°C ambient

Light engine and drivers are accessible from above or below ceiling.

Max ceiling thickness 1-1/2".

### OPTICS:

LEDs are binned to a 3-step SDCM; 80 CRI minimum.

LED light source concealed with diffusing optical lens.

General illumination lighting with 1.0 S/MH and 55° cutoff to source and source image.

Self-flanged anodized reflectors in semi-specular finish.

### ELECTRICAL:

Multi-volt (120-277V, 50/60Hz) 0-10V dimming drivers mounted to junction box, 10% minimum dimming level available.

0-10V dimming fixture requires two (2) additional low-voltage wires to be pulled.

70% lumen maintenance at 60,000 hours.

### LISTINGS:

Certified to US and Canadian safety standards. Wet location standard (covered ceiling).

IP55 rated. ENERGY STAR® certified product. More configurations are available. Click here or visit [www.acuitybrands.com](http://www.acuitybrands.com) and search for LDN.

### WARRANTY:

5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at:

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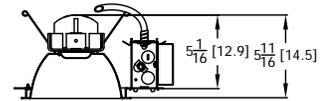
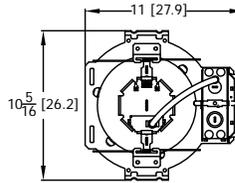
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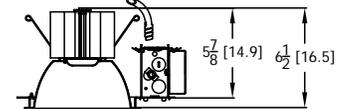
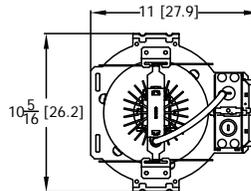
## Dimensions

### LDN6 500-1500 LUMEN



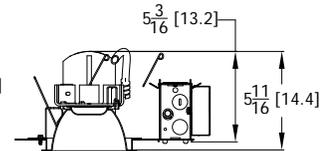
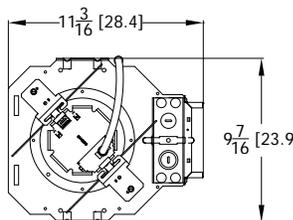
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Ceiling Opening: 7-1/8 (18.1)  
Overlap trim: 7-1/2 (19.1)

### LDN6 2000 LUMEN



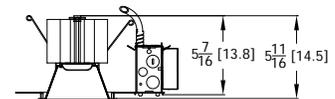
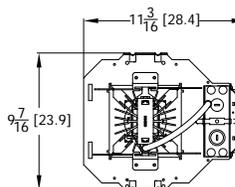
Aperture: 6-1/4 (15.9)  
Ceiling Opening: 7-1/8 (18.1)  
Overlap trim: 7-1/2 (19.1)

### LDN4 500-1500 LUMEN



Aperture: 4-5/16 (11)  
Ceiling Opening: 5-1/8 (13)  
Overlap trim: 5-7/16 (13.8)

### LDN4 2000 LUMEN



Aperture: 4-5/16 (11) Square  
Ceiling Opening: 5-1/8 (13) Square  
Overlap trim: 5-7/16 (13.8) Square

All dimensions are inches (centimeters) unless otherwise indicated.



# LAE Series

## Aluminum Slim Edge-Lit Pictogram Exit Sign



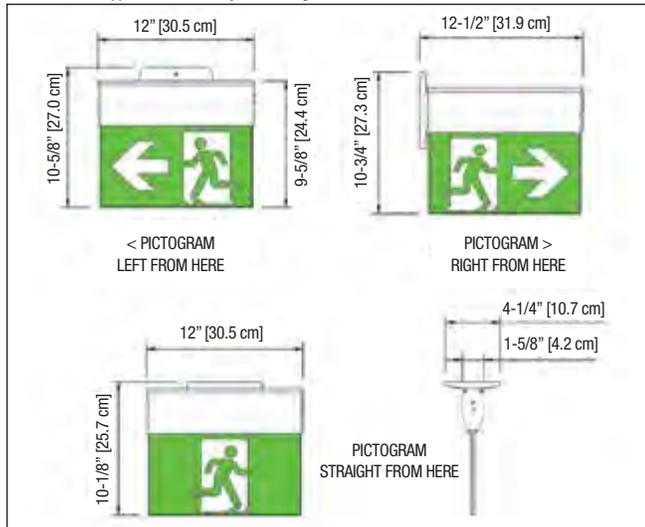
### FEATURES

- Slim-profile extruded Aluminum housing
- Universal surface mounting – wall, ceiling or end mount
- Click-to-open housing door allows easy access to the panel and electrical wiring
- Acrylic panel with pictogram legend
- Long-life white LED light sources is warranted for ten (10) years
- Universal AC input: two-wire 120 to 347VAC; standard DC input: two-wire 6 to 24VDC
- Energy efficient – consumes less than 3W in AC or DC-remote mode
- Self-Powered models provide minimum 120 minutes of emergency lighting
- Special wording available (CSA 22.2 No. 250.0)
- Meets or exceeds CSA 22.2 No. 141-15

See warranty details at: [www.tnb.ca/en/brands/lumacell](http://www.tnb.ca/en/brands/lumacell)

### DIMENSIONS

Dimensions are approximate and subject to change.



### TYPICAL SPECIFICATIONS

Supply and install the Lumacell® LAE Series of slim-profile pictogram Edge-Lit Exit Signs. The unit shall operate with universal 2-wire AC input voltage of 120 to 347VAC at less than 3W and universal 2-wire DC input voltage from 6 to 24VDC at less than 2.5W. The housing assembly shall be constructed of extruded aluminum with textured finish and \_\_\_\_\_ colour. The canopy shall be of Die-Cast aluminum and allow for wall, end, or ceiling mount. The legend shall be printed on a pure-acrylic panel. The panel shall come standard with double-face legend, for single-face and double-face applications. The light source shall be long-life white light-emitting diodes (LED) and shall provide even illumination in normal and emergency operation. The pictogram Edge-Lit Exit Sign in a Self-Powered configuration shall use a sealed Nickel-Cadmium battery of 2.4V nominal voltage and shall stay illuminated during emergency operation for at least 120 minutes upon AC failure.

The pictogram Edge-Lit Exit Sign shall be CSA 22.2 No. 141-15 certified.

The equipment shall be Lumacell® Model: \_\_\_\_\_.

### POWER CONSUMPTION

MODEL	AC SPECS		DC SPECS	
AC-only	120 to 347VAC	Less than 3W	-	-
AC/DC standard	120 to 347VAC	Less than 3W	6 to 24VDC	Less than 2.5W
AC/48VDC	120 to 347VAC	Less than 3W	48VDC	2W
AC/120VDC	120 to 347VAC	Less than 3W	120VDC	4.7W
Two-wire 120V AC/DC	120VAC	Less than 3.5W	120VDC	Less than 3.5W
Self-Powered	120 to 347VAC	Less than 4W	Ni-Cd battery	120 minutes

### ORDERING INFORMATION

SERIES	FACES/ARROW	HOUSING COLOUR	VOLTAGE	OPTIONS
LAE= extruded aluminum edge-lit pictogram exit sign	<p>1= single face, no arrow</p> <p>L= single face, left arrow</p> <p>R= single face, right arrow</p> <p>A= double face, arrow left or right</p> <p>Blank= special wording</p> <p>_U9= arrow up*</p> <p>_D9= arrow down*</p> <p>_U4= arrow up 45°*</p> <p>_D4= arrow down 45°*</p>	<p>OW= off-white</p> <p>TA= textured aluminum</p>	<p>AC= 120 to 347VAC only</p> <p>ACD= 120 to 347VAC; 6 to 24VDC</p> <p>SP= Self-Powered, 120 to 347VAC*</p> <p>U48= 120 to 347VAC; 48 VDC</p> <p>U120= 120 to 347VAC; 120 VDC</p> <p>2120= 2-wires 120VAC/VDC</p>	<p>LP= panel shipped separately*</p>
	* Indicate 1 or 2 faces		* Self-Powered (120 minutes time base)	* Order panel separately

EXAMPLE: LAEATASP

Unlike EXIT signs, the pictogram sign is not available in double arrow configurations.

