# **DESIGN + CONSULTANT TEAM**

**ARCHITECT & PRIME CONSULTANT** LANDSCAPE ARCHITECT STRUCTURAL ENGINEERING ELECTRICAL ENGINEERING MECHANICAL ENGINEERING



**INTERPRETIVE PLANNING & DESIGN:** 

**ALDRICHPEARS** ASSOCIATES

HYDROGEN CONSULANTS:





**CIVIL ENGINEER: ASSOCIATED ENGINEERING** 

# **UBC TRANSPORTATION TESTBED PROJECT PHASE 1 - HYDROGEN FUEL STATION DEVELOPMENT PERMIT APPLICATION | 01 FEB 2021**



THE UNIVERSITY OF BRITISH COLUMBIA



# CONTENTS / DATA

# **DRAWING LIST**

- DP 01 Drawing Index / Project Information
- DP 02 Project Description
- DP 03 Project Location
- DP 04 **Design Rationale**
- DP 05 Site / Phasing Plan
- DP 06 Site Photos
- DP 07 Perspective Rendering
- DP 08 Perspective Rendering
- DP 09 Perspective Rendering
- DP 10 Perspective Rendering DP 11
- Rendering Night Lighting / CPTED DP 12 Perspective Rendering - Birdseye

# DRAWING REQUIREMENTS

PH1-A0.00	Cover Sheet
PH1-A0.01	Context Plan
PH1-A0.02	Survey Plan
PH1-A0.03	Utilities Plan - Subsurface
Civil	General Notes
Civil	Site Grading and Servicing
PH1-A0.04	Shadow Studies
PH1-A1.01	Site Plan (1:100)
PH1-A1.02	Layout Plan (1:100)
PH1-A1.03	Canopy Plan
PH1-A4.01	Elevations
PH1-A4.02	Elevations
PH1-D.01	Site Demolition Plan

# LANDSCAPE

L1.00	Landscape Concept
L1.01	Tree Protection Plan
L1.02	Conceptual Planting Zones
L1.03	Planting Plan
L1.04	Conceptual Lighting Plan
L1.05	Landscape Details
L1.05	Landscape Details

# **APPENDICIES**

APPX A Interpretive Plan / Signage Document

# **UBC TRANSPORTATION TESTBED PROJECT** PHASE 1: HYDROGEN FUELING STATION

# ADDRESS

UBC Thunderbird Parkade 6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# LEGAL DESCRIPTION

Parcel Identifier: 015-891-909 District Lot 3044 Group 1 New Westminster District Except Firstly; Part on Plan 6147 Secondly; Part on Plan 9301 Thirdly; Part on Plan BCP6556 Fourthly: Part on Plan BCP23719

# CODE REQUIREMENTS

2020 NFPA 2: All others







# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 2021 FEB 01 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6 design@designdialog.ca Fax: (604) 255-1790

CIVIL ENGINEER ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGIN INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790



digital certificate, or when printed the digita

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# DRAWING LIST **PROJECT INFO**

DRAWN: PLOT DATE: 1/28/21

CHECKED:

**DP 01** 

BC100018 BC100018\_20210125\_PHASE 1 v2016.vwx

# **PROJECT DATA / CODE SUMMARY**

2018 BCBC : Canopy - Type 1, Non-combustible



# **PROJECT DESCRIPTION / OVERVIEW PROJECT BACKGROUND**

The future of transportation faces multiple challenges, not only due to the introduction of new technologies and their required infrastructure but also with ensuring improved economic efficiency, environmental impact, energy security, social equity, livability, and health

In partnership with industry and government, the UBC Clean Energy Research Centre: Clean Connected and Safe Transportation Testbed (Transportation Testbed) will be a city-scale, living laboratory that supports fundamental and translational research into all these issues while developing and deploying the next generation of clean, connected and safe transportation systems and technologies.

# **FACILITY PROGRAM**

Phase 2 of the project will connect the hydrogen generation to renewable power, with the addition of a large solar array on the roof of the adjacent parking garage.

In preparation for Phase 1 a new electrical feeder will be provided to the Thunderbird Parkade with capacity to supply power to the Hydrogen Station and have provisions to accommodate for the transfer of the excess power generated by the solar array to UBC's electrical grid. As part of this preliminary work a new external electrical room and a battery energy storage system (BESS) will be installed outside Thunderbird Parkade and advanced EV chargers will be installed on the parkade's ground floor.

# PHASE 1

- 2. Heavy duty hydrogen dispenser,
- fuelina

- 6 Educational facilities and interpretive signage



# SYSTEMS / PHASING DIAGRAM

A Hydrogen Generation and Refueling Station (Hydrogen Station) is Phase 1 of the broader Transportation Testbed program. In addition to generating, compressing and dispensing hydrogen, the Hydrogen Station will act as an education hub drawing in students and the public. The project will include both a research facility for future transportation fuels as well as an educational facility that will inform the public about the research and the potentials of the technology.

Once Phase 1 and 2 are complete, the facility in its entirety will include solar panels which collect energy and convert it into fuel of two types: electricity and hydrogen. The energy can be stored at the facility by a large battery bank as well as be converted into hydrogen for storage. Excess power will be transferred back to UBC's grid offsetting the campus energy consumption. The flow of energy and its transmission is key to the research and the expression of the flow is part of the design intent of the station.

The requirement for design is to accommodate on site:

1. Light duty hydrogen dispenser,

- 3. Space to pull up and be out of traffic, while

4. Electrolyzer equipment / container

5. Compression and storage container





# THE UNIVERSITY OF BRITISH COLUMBIA

ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED DO NOT SCALE THIS DRAWING

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6 Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERI Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGI 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790



ligital certificate or when prin

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# PROJECT OVERVIEW

DRAWN: PLOT DATE: 1/27/21

CHECKED:







# PROJECT SITE

After reviewing a number of site options on campus, an area currently occupied by a basketball court was selected. In order to have sufficient information to secure the proposed site through the Site Selection Committee, the research team engaged UBC's School of Architecture and Landscape Architecture (SALA). An initial layout and some aspirational images were created for the Hydrogen Station with input from Bunt & Associates Engineering Ltd. (traffic consultant).

Due to the removal of the existing basketball court the design of the new public area should take into consideration ways of mitigating the loss of this amenity and allowing some of the previous activities to still take place in that space while providing the required infrastructure and visibility for the new equipment.

This includes a place to gather for the skateboard park users as part of their yearly celebration. Relocation of the basketball hoops to a nearby site will also be part of the project's scope if the new location is confirmed by Campus and Community Planning in time.

To minimize impact to the campus public realm UBC Campus and Community Planning has requested that no trees be removed as part of this equipment installation so every effort must be made to preserve existing trees.

# LEGEND

- RESIDENTIAL BOUNDARY
- PRIMARY VEHICLE ROUTE
- - BIKE / PEDESTRIAN ROUTE
  - NORTH / SOUTH GREENWAY
- COMMUNITY SHUTTLE / TRANSIT ROUTE

- 1. Thunderbird Parkade
- 2. District Energy Centre
- 3. Substation
- 4. Pharmecutical Sciences
- 5. Osborne Center
- 6. Thunderbird Sports Centre
- 7. Tennis Centre
- 8. Life Sciences
- 9. TEF 3

"The testbed will link two narratives --technology and people. It will provide a space to gather, engage and think deeply about the way we want to live."



# 12/2/20 4:40:58 PM Date: -Time: -

# "A CITY SCALE TESTBED" DIAGRAM





# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOT DO NOT SCALE THIS DRAWING

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTAN' FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6 Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEER Kelowna, B.C, V1Y 7T: Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENO INTERIOR DESIGN PLANNING IN 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790



UBC TRANSPORTATION TESTBED PHASE

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# **PROJECT LOCATION**

DRAWN: PLOT DATE: 1/27/21

CHECKED:

**DP 03** 

# DESIGN RATIONALE **DESIGN POLICY COMPLIANCE**

# **DESIGN BRIEF**

Develop a Clean Connected and Safe Transportation Testbed (Hydrogen fueling station) that will be a city-scale, living laboratory and supports fundamental and translational research, while also demonstrating the potential for improved economic efficiency, environmental impact, energy security, social equity, livability, and health

In addition to generating, compressing and dispensing hydrogen, the Hydrogen Station will act as an education hub drawing in students and the public. The project will include both a research facility for future transportation fuels as well as an educational facility that will educate the public about the research and the potentials of the technology.

The flow of energy and its transmission is key to the research and the expression of the flow is part of the design intent of the station.

Date: 12/2/20 Time: 4:40:58 PM File name: BC100018



"WHAT IF...a vehicle fueling station could be integrated into the

public realm as an urban

amenity?"



# **DESIGN RESPONSE**

# Siting

The general arrangement of the program equipment is along a diagonal path that divides the site into two triangular zones,and connects the Thunderbird Blvd sidewalk with the north-south greenway path. The diagonal path "spine" is intended to be a counterpoint to the existing cartesian campus grid, and symbolic of the "OFF GRID", renewable energy being produced on site. The upper triangular zone respects and preserves 4 mature, deciduous trees, while also protecting 2 existing trees in the lower zone.

The diagonal spine also expresses and FOLLOWS THE FLOW of mechanical and electrical connections leading to the Thunderbird Parkade where EV and solar components of the project will be located

# **Enhance Pedestrian Routes**

The site is adjacent to the intersection of Thunderbird Blvd , which is a major east-west axis, and north end of the Athlete's Way greenway. The siting and layout of the project establishes a natural "desire line" across the site that connects, and augments the existing established routes at this particular intersection.

The sidewalk along Thunderbird is gently diverted around the vehicle forecourt in a natural, bowing path that also engages the site and education hub at the centre of the site, before it reconnects with the existing sidewalk.

# **Public Realm**

The site plan aims to improve and support the pedestrian experience across the site by providing an accessible, well lit pathway that engages the passerby with interpretive information, and informal learning, while also providing spaces to sit, linger, and socialize in a landscaped, park like setting.





# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTEI VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6 Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERI Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENG INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790



digital certificate or when pri the digita

UBC TRANSPORTATION TESTBED PHASE

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# **DESIGN RATIONALE**

DRAWN: PLOT DATE: 1/27/21

CHECKED:

**DP 04** 





:: 12/2/20 :: 4:41:04 PM name: BC100018

Date: -Time: -

# SITE / PHASING PLAN

Located in and around UBC's Tunderbird Parkade, the site can be accessed by a pedestrian walkway from the [north] near the Pharmaceutical Sciences Building and the Campus Energy Centre

Visitors in vehicles will approach the site from Thunderbird Boulevard, pulling up and out of traffic to use the Hydrogen fuelling

Directly adjacent, the site will continue to be animated by a

Once complete, the site will consist of the following linked infrastructure, some of which will be visible to visitors arriving by

A. 1-megawatt photovoltaic (PV) array (Phase 2)

C. E-House (and a nearby transformer) (Phase 0)

D. 10 Electric Vehicle (EV) chargers (Phase 0)

G. Canopy and Hydrogen fuelling station 

On the roof of the Thunderbird Parkade, the PV array will collect energy and convert it into fuel of two types: electricity and hydrogen. From there, energy will follow through multiple paths

Stored in battery form until needed

Used to power the new EV charging stations located

· Used to convert water into hydrogen in the electrolyzer

Stored and dispensed as needed at the hydrogen

• In the future, hydrogen may be injected into the natural gas grid or used to power the boilers in the





# THE UNIVERSITY OF BRITISH COLUMBIA

ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

# ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6

Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790



This document has been dig certified with digital certificat encryption technology authorized the Architectural Institute of BC a supplied by the architect, bearing images of the professional seal and digital certificate, or when printe n the digital

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# SITE PLAN PHASING PLAN

DRAWN: PLOT DATE: 1/27/21

CHECKED:

**DP 05** 



LOOKING SOUTHWEST FROM N/S PATHWAY





LOOKING NORTHWEST FROM THUNDERBIRD BLVD

# **AERIAL IMAGE LOOKING NORTH**





# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSION

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT ARCHITECT & PRIME CONSO DIALOS 62 ARCHITECTURE ENGINECENING INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tei: (604) 255-1160 Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGINE INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (604 design@designdialog.ca Fax: (604) 255-1790





digital certificate, or when printed n the digita

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# SITE PHOTOS

DRAWN: PLOT DATE: 1/27/21

CHECKED:

DP 06



HYDROGEN STORAGE CONTAINER

- Metal mesh mechanical screen

- Container painted w/vinyl wrap panels with infographics

- Container painted w/vinyl wrap panels with infographics

- Interpretive opportunity - Lighting along top edge valance

- Interpretive opportunity - Lighting along top edge valance

ELECTROLYZER CONTAINER

- Metal mesh mechanical screen

-CANOPY - Painted structural steel frame with mass timber frame "infill" structure - Tempered / laminated glass roof held off with stainless steel stand-off fittings



VIEW LOOKING EAST TOWARDS WESBROOK MALL

EXISTING SKATE PARK

NEW PEDESTRIAN CONNECTOR TO GREEWAY AND PARKADE

# PERSPECTIVE VIEW





# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT ARCHITECT & PRIME DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tei: (604) 255-1169 Fax: (6 design@designdialog.ca Fax: (604) 255-1790

CIVIL ENGINEER ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGIN INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tei: (604) 255-1169 Fax: (60 design@designdialog.ca Fax: (604) 255-1790



ute of BC supplied by the arc images of the profe digital certificate, or when printed n the digita

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# PERSPECTIVE

DRAWN: PLOT DATE: 1/27/21

CHECKED:

DP 07



ELECTROLYZER CONTAINER - Metal mesh mechanical screen - Container painted w/vinyl wrap panels with infographics - Interpretive opportunity - Lighting along top edge valance

- CANOPY - Glass roof for keeping forecourt dry - Vented glass panels to prevent hydrogen from collecting



VIEW LOOKING EAST ALONG THUNDERBIRD BLVD

-HYDROGEN DISPENSER

FORECOURT BARRIER - Steel rail, stanchions, ptd. - Integrated LED strip lighting, downlight from rail

AUTO FORECOURT - Accommodates 40' bus on passenger side of pump - Fuel cell cars on either side

-BIKE LANE PAINTING -Improved bike lane markings where vehicles cross

# PERSPECTIVE VIEW





# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSION

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT 
 ARCHITECT & PRIME CONSO

 DIALOG EC ARCHITECTURE ENGINEERING

 INTERIOR DESIGN PLANNING INC.

 406 - 611 ALEXANDER STREET

 VANCOUVER, BC, VEA 1E1

 Tei: (604) 255-1169

 Fax: (604) 255-1790

 design@designdialog.ca

CIVIL ENGINEER

ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGINE INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tei: (604) 255-1169 Gesign@designdialog.ca Fax: (604) 255-1790





ute of BC supplied by the arch images of the profest itect, bearing digital certificate, or when printed n the digita

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# PERSPECTIVE

DRAWN: PLOT DATE: 1/27/21

CHECKED:

DP 08



ELECTROLYZER CONTAINER

- Metal mesh mechanical screen - Container painted w/vinyl wrap panels with infographics
  - Interpretive opportunity
    - Lighting along top edge valance

-READER RAIL Interpretive info panel

STORMWATER BASIN

- Built-in covered seating

- Celebrates water as source of hydrogen

- Drains to manage stormwater in bioswale / detention pond

VIEW OF SMALL SCALE PLAZA / EDUCATION HUB

Date: 12/2/20 Time: 4:41:01 PM File name: BC100018

# PERSPECTIVE VIEW







# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSION

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT ARCHITECT & PRIME CONSO DIALOS 62 ARCHITECTURE ENGINECENING INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tei: (604) 255-1160 Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERING Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGINEE INTERIOR DESIGN PLANNING INC. 406-611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tei: (604) 255-1169 Fax: (604) design@designdialog.ca Fax: (604) 255-1790





This document has b certified with digital c nology authorized ral Institute of BC a a true copy of the original whe supplied by the architect, bearing images of the professional seal and digital certificate, or when printed from the digitally-certified electror

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# PERSPECTIVE

DRAWN: PLOT DATE: 1/27/21

CHECKED:

DP 09



# PERSPECTIVE VIEW

# NIGHT VIEW ALONG THUNDERBIRD BLVD





# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSION

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT 
 ARCHITECT & PRIME CONSO

 DIALOG EC ARCHITECTURE ENGINEERING

 INTERIOR DESIGN PLANNING INC.

 406 - 611 ALEXANDER STREET

 VANCOUVER, BC, VEA 1E1

 Tei: (604) 255-1169

 Fax: (604) 255-1790

 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERING Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGINEE INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Fax: (604) 255-1790





This document has been digitally certified with digital certificate an encryption technology authorized t the Architectural Institute of BC an a true copy of the original whe supplied by the architect, bearing images of the professional seal and from the digital certificate, or when printed from the digitally-certified electror file provided by the architect

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# PERSPECTIVE

DRAWN: PLOT DATE: 1/27/21

CHECKED:

**DP 10** 



HYDROGEN STORAGE CONTAINER - Metal mesh mechanical screen - Container painted w/vinyl wrap panels with infographics - Interpretive opportunity - Lighting along top edge valance



# NIGHT VIEW ALONG THUNDERBIRD BLVD

- INTERPRETIVE WATER FEATURE (to be designed) - Catches and conveys stormwater from canopy down to stormwater basin - Integrated into stormwater basin / covered seating node - Will be designed to contain rainwater without splashing onto pathway

STEEL GRATING / WALKING SURFACE - Exposes the water drainage from basin to bioswale

# PERSPECTIVE VIEW





# THE UNIVERSITY OF BRITISH COLUMBIA

ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSION

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT ARCHITECT & PRIME CONSO DIALOS 62 ARCHITECTURE ENGINECENING INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tei: (604) 255-1160 Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN LANUSCAPE DESIGN DIALOG BC ARCHITECTURE ENGINE INTERIOR DESIGN PLANNING INC. 406-611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Te1: (604) 255-1169 Te1: (604) 255-1169 Fax: (604 Fax: (604) 255-1790



This document has Institute of BC supplied by the arch images of the profest itect, bearing sional seal an digital certificate, or when printed m the digital

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# PERSPECTIVE

DRAWN: PLOT DATE: 1/29/21

CHECKED:

**DP 11** 



**AERIAL NIGHT VIEW: LIGHTING IMPROVEMENTS** 

# CPTED APPROACH

# **1. SAFE LIGHTING LEVELS AND HIGH VISIBILITY**

The equipment containers are proposed to be designed with a valance along its perimeter, which will provide lighting and security on all

The underside of the canopy will be well lit to supply adequate illumination for dispensing hydrogen fuel. The canopy partially covers a portion of the public realm, which will provide "spill over" effect.

Light standards are proposed to be added to the north/south greenway as a way of offering continuity to the other phases of this project.

The site will also have several security video cameras installed to prevent vandalism, and

# 2. NATURAL SURVEILLANCE

The project is sited adjacent to Thunderbird Blvd, which is a primary east / west pedestrian and vehicle route, which provides a precesence to the site. It is also adjacent to Thunderbird Parkade, which provides an overlook to the site, and help contribute to a "eyes on the street" natural surveillance approach to design

# 3. TREE LINE

We studied lighting the existing pathway to the north with bollard lights to improve the CPTED requirement for the area. This however appeared to have the unintended effect of inviting users into a secondary path, which may be worse from a CPTED point of

We propose keeping the pathway, and the connection to the skate park, and rely on the ambient lighting from the electrolyzer container to supplement the lighting levels.





# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6 Fax: (604) 255-1790

design@designdialog.ca CIVIL ENGINEER ASSOCIATED ENGINEERII Suite 610-1632 Dickson Ave

Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790



digital certificate, or when printe the digita

**UBC TRANSPORTATION TESTBED PHASE 1** 

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# AERIAL NIGHT VIEW CPTED

DRAWN: PLOT DATE: 1/29/21

CHECKED:

DP 12



# UBC TRANSPORTATION TESTBED PROJECT



the public about the research and the potentials of the technology.





# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT



# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

# ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6

Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERI Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

### STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENG INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790

SEAL



digital certificate or when pr

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# COVER SHEET **PROJECT INFO**

DRAWN: PLOT DATE: 1/29/21

CHECKED:

PH1-A0.00



Date: 12/2/20 Time: 4:40:58 PM File name: BC100018

1 CONTEXT PLAN 1:1000

![](_page_15_Picture_3.jpeg)

![](_page_15_Picture_4.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT

![](_page_15_Picture_8.jpeg)

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSION

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT 
 ARCHITECT & PRIME CONSU

 DIALOS BC ARCHITECTURE ENGINEERING

 INTERIOR DESIGN PLANNING INC.

 406 - 611 ALEXANDER STREET

 VANCOUVER, BC, VBA 1E1

 Tel: (604) 255-1169

 Fax: (604) 255-1790

 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERING Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN LAINDSCAPE JESIGN DIALOS GC ARCHITECTURE ENGINEE INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (604) : design@designdialog.ca Fax: (604) 255-1790

![](_page_15_Picture_19.jpeg)

This document has been digitally certified with digital certificate and encryption technology authorized by the Architectural Institute of BC and the Architectural institute of BC and the Engineers and Geoscientists BC. The authoritative original has been transmitted you in digital form. Any printed version can be relied upon as a true copy of the original when supplied by the architect, bearing images of the professional seal and digital certificate, or when printed from the digitaly-certified electronic tile provided by the architect.

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# CONTEXT PLAN

DRAWN: PLOT DATE: 1/29/21

CHECKED:

PH1-A0.01

![](_page_16_Picture_0.jpeg)

Date: 4/26/20 Time: 7:34:38 PM File name: BC100018

![](_page_16_Picture_2.jpeg)

![](_page_16_Picture_3.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT

![](_page_16_Picture_7.jpeg)

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSION

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT 
 ARCHITECT & PRIME CONSU

 DIALOS BC ARCHITECTURE ENGINEERING

 INTERIOR DESIGN PLANNING INC.

 406 - 611 ALEXANDER STREET

 VANCOUVER, BC, VBA 1E1

 Tel: (604) 255-1169

 Fax: (604) 255-1790

 design@designdialog.ca

CIVIL ENGINEER

ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN LANDSCAPE DESIGN DIALOS BC ARCHITECTURE ENGINEERING INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tol: (604) 255-1160 Fax: (604) 255-1790 design@designdialog.ca

![](_page_16_Picture_19.jpeg)

This docum Institute of BC supplied by the arc images of the profe itect, bearing sional seal an digital certificate, or when printed from the digitally-certified electror

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

SURVEY PLAN

![](_page_16_Picture_23.jpeg)

Ν  $\square$ SURVEY PLAN 

DRAWN: PLOT DATE: 1/29/21

CHECKED:

PH1-A0.02

![](_page_17_Figure_0.jpeg)

![](_page_17_Picture_3.jpeg)

![](_page_17_Picture_4.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT

![](_page_17_Picture_8.jpeg)

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6 Fax: (604) 255-1790

design@designdialog.ca CIVIL ENGINEER ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGINE INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790

![](_page_17_Picture_18.jpeg)

![](_page_17_Picture_19.jpeg)

This document has been digitally certified with digital certificate an encryption technology authorized b the Architectural Institute of BC and the Architectural institute of BC and the Engineers and Geoscientists BC. The authoritative original has been transmitted to you in digital form. Any printed version can be relied upon as a true copy of the original when supplied by the architect, bearing images of the professional seal and from the digital certificate, or when printed from the digitally-certified electror file provided by the architect

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

**EXISTING UTILITIES** 

SUBSURFACE

DRAWN: PLOT DATE: 1/29/21

CHECKED:

PH1-A0.03

BC100018 BC100018\_20210125\_PHASE 1 v2016.vwx

![](_page_17_Picture_29.jpeg)

1 SUBSURFACE UTILITIES Scale: 1:200

LINETYPES						HATCH PATTERNS
MISCELLANEOUS	EXISTING	PROPOSED	WATER	EXISTING	PROPOSED	
FENCE			WATER MAIN			
, Ende			VAULT BOX	IWI	Ŵ	PROPOSED CONCRETE
BUILDING		Privil	FIRE HYDRANT	(FH)	FH	
		1 1	MANHOLE	W	Ŵ	
			END CAP / PLUG		- -	PROPOSED APPLIA T
SWALE			GATE VALVE		4	PROPOSED ASPHALT
			STORM DRAINAGE			
			CULVERT			PROPOSED BIO-SWALE - DESIGNED
10/1			STORM SEWER		p	BY LANDSCAPE ARCHITECT
IREE			CATCH BASIN	CB	CB	
			CATCH BASIN / MANHOLE	CH	(CB)	PROPOSED LANDSCAPE - SEE
			MANHOLE	D	Õ	LANDSCAPE DRAWINGS FOR DETAILS
	1 - 1					
TREE REMOVAL	-		SANITARY SEWER			
	\ J		SANITARY SEWER			
	1		SANITARY MANHOLE	3	S	
			COMMUNICATIONS / TELEPHO	DNE		
	+ ages	30 SP	TELEPHONE/LINE		t	
SPOT ELEVATION			UNDERGROUND TELEPHONE		U7	
SLOPE		- 19 <u>6</u>	ELECTRICAL / POWER			
CANOPY OUTLINE			POWER / COMM / CONDUIT	Y	p	
			OVERHEAD POWER			
PROPERTY			UNDERGROUND POWER			
PARCEL/LOT LINE			LIGHT / LAMP STANDARD		Ŷ.	
			HYDRO / UTILITY POLE		-0-	
EASEMENT			GUY WIRE		$\rightarrow$	
STATUTORY ROW			CARION			
ROAD ROW			GAS/UIL			
			GAS			

# GENERAL NOTES

- 1. ALL WORK TO BE COMPLETED IN ACCORDANCE WITH MMCD PLATINUM, AND UBC DESIGN GUIDELINES
- 2. ALL MATERIALS TO BE NEW & CSA APPROVED.
- 3. ALL LANDSCAPING TO BE RESTORED AS PER UBC DESIGN GUIDELINES, TO ORIGINAL OR BETTER CONDITION. REFER TO LANDSCAPE DRAWINGS FOR PROPOSED LANDSCAPING.
- 4 ALL DIMENSIONS, ELEVATIONS AND MEASUREMENTS INDICATED ARE IN METRES UNLESS NOTED OTHERWISE.
- 5. ELEVATIONS ARE BASED ON GEODETIC DATUM
- 8. ALL EXCAVATED MATERIALS REMOVED AND DISPOSED OF IN ACCORDANCE WITH UBC SPECIFICATIONS.

# UTILITIES

- 7. CONTRACTOR TO CONTACT LOCAL UTILITY AUTHORITIES AND COORDINATE UTILITY LOCATES. CONTRACTOR TO COMPLETE A BC ONE CALL PRIOR TO CONSTRUCTION. ALL ELEVATIONS AND LOCATIONS OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY
- 8. CONTRACTOR TO COORDINATE WITH ENGINEER AND APPROPRIATE UTILITY AUTHORITY PRIOR TO ADJUSTING ANY UTILITY INFRASTRUCTURE
- 9. MAINTAIN MINIMUM 0.30m CLEAR VERTICAL SPACING BETWEEN CROSSING UTILITIES.
- 10. LAWN BASIN AND CATCH BASIN AS PER MMCD PLATINUM.

SIGNATURE

C		OFBR	ITISH	COLUM
iss A B	UED FOI 80% S DP	R CHEMATIC I	DESIGN	08/07/2020 01/29/2021
CON Include addati correst correst correst correst	NSTRU traction dec e e complete de, bid fet nemts are so tents will b tection dec	CTION DOO annants conest of allon of changes r listors and offser ubstantality consi mail by docume a losed to rulerpp aments and colum	CUMENT: Impelified spe- nade to the bio experiments of the iss, addende a statute of the statute	S DISCLAIME chrations and drawe I decurrents alesad inge (d anu). Conten rad big revisions, Cor and big revisions, Cor any differences betwee occur.
ME THIS REPO VERI DO N REPO FOR	TRIC DRAWING IODUCED, DIMENSIOI FY DIMENSIO OT SCALE MET PIGOR CLARIFICZ ATIONS FF	IS COPYRIGHT OR REVISED W IS ARE IN MILLI STONS THIS DRAWING ISISTENCIES AN ITION BEFORE C ROM THE CONTRE	ED AND MUST THOUT WRIT AFTERS UNLI D OMISSION XOMMEDICING CACT DOCUM	THOT BE USED, TEIL PERMISSION ESS OTHERWISE M S TO THE CONSULT WITH THE WORK. ENTS WITHOUT
AR DVALE NATE NATE NATE NATE NATE NATE NATE NAT	CHITE DG BC AR BOR DESI BIT ALEXA DOUVER, P SOR DESI BIT ALEXA DOUVER, P SOR DESI DOUVER, P SOR DESI DOUVER, P SOR DESI SOR DESI SOT AS SOR DESI SOT AS SOR DESI SOT ALEXA DOUVER, P SOR DESI SOT ALEXA DO CHIE SOT ALEXA DO CHIE SO	CT & PRIN HITECTURE EN INDERSTREET (c) VAA IED GE GE SINEER NOMERSTRAET GE SINEER NOMERSTRAET SINEER ICAL I	ME CON: GRIEERING IC: IC: LTQ GRIEERING GRIEERING IC: LTQ GRIEERING IC: LTQ IC: LTQ IC	790 7790
SEA	2021	101-29	This di confide encryp (hs An the Em The au Iranom profide a true supple images digital from the file pro-	cournent has breen di d with digital certifica don tecturology allut characturology allut dineative can be compared interfactural for a language with the acchiles, b of the professional certificate, or when p e digitally confine el wided by the architer
UB PH	C TR	ANSPOF	RTATIC	N TESTBI
			KADE d, Vancouv ERAI ND	er, BC V8T 2A1
SCA		1		CHECKED

![](_page_19_Figure_0.jpeg)

![](_page_20_Picture_0.jpeg)

![](_page_20_Picture_2.jpeg)

![](_page_20_Figure_4.jpeg)

**SPRING - 10AM** 

![](_page_20_Picture_7.jpeg)

**SPRING - 12PM** 

![](_page_20_Picture_9.jpeg)

**SPRING - 2PM** 

![](_page_20_Figure_13.jpeg)

![](_page_20_Figure_14.jpeg)

![](_page_20_Figure_15.jpeg)

SUMMER - 12PM

SUMMER - 2PM

![](_page_20_Picture_18.jpeg)

![](_page_20_Picture_19.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT

![](_page_20_Picture_23.jpeg)

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSION

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT ARCHITECT & PRIME CONSO DIALOS 62 ARCHITECTURE ENGINECENING INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tei: (604) 255-1160 Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN LANDSCAPE DESIGN DIALOS BC ARCHITECTURE ENGINEERING INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tol: (604) 255-1160 Fax: (604) 255-1790 design@designdialog.ca

![](_page_20_Picture_33.jpeg)

2021-Feb-01

digital certificate, or when printe from the digitally

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# SHADOW STUDIES

DRAWN: PLOT DATE: 1/29/21

CHECKED:

PH1-A0.04

![](_page_21_Figure_0.jpeg)

# **KEYNOTE LEGEND**

# HYDROGEN STORAGE CONTAINER

- Hydrogen Storage Cylinders
- Compressor Module
- Concrete pad with 3m Safety Zone
- Vinyl wrap graphic surface treatment, TBD

# 2 ELECTROLYZER CONTAINER

- Electrical Room
- Electrolyzer
- Supporting Equipment
- Vinyl wrap graphic surface treatment, TBD

# **BIOSWALE / DETENTION BASIN**

- Filters discharge water from electrolyzer process
- Retains water for slow infiltration
- Natural safety buffer

# VEHICLE FORECOURT / DISPENSER

# STORMWATER BASIN

- Canopy runoff
- Drains to bioswale / detention basin
- Interpretive water feature

# EXISTING DECIDUOUS TREES

# TREES TO BE REMOVED

# CONCRETE PATHWAY

- Establishes "desire line" connection to main north - south walkway

# **10 EXISTING BENCH**

# 11 EXISTING PATHWAY

# 12 INTERPRETIVE "EDUCATION HUB"

- Infographic displays / panels

# 13 METAL GRATING

- Expose and feature piping trenches

# 14 EXISTING UNDERGROUND UTILITY VAULT

EXISTING / SITE CONSTRAINT

![](_page_21_Picture_34.jpeg)

![](_page_21_Picture_35.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT

![](_page_21_Figure_39.jpeg)

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED DO NOT SCALE THIS DRAWING

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

# ARCHITECT & PRIME CONSULTANT

DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6 Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERII Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790

![](_page_21_Picture_49.jpeg)

This document has be certified with digital cert encryptic the Archi technology authorized ctural Institute of BC a a true copy of the original whe supplied by the architect, bearing images of the professional seal an digital certificate, or when printed from the digitally-certified electron

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# SITE PLAN 1:100

DRAWN: PLOT DATE: 1/30/21

CHECKED:

PH1-A1.01

![](_page_22_Figure_0.jpeg)

Date: 11/24/20 Time: 12:07:31 F File name: BC100

- SCOPE OF WORK

![](_page_22_Picture_4.jpeg)

![](_page_22_Picture_5.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

C 02 DEC 2020 HAZID REVIEW

![](_page_22_Picture_9.jpeg)

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE N VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTAN' FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

# ARCHITECT & PRIME CONSULTANT ARCHITECT & PRIME DIALOG BC ARCHITECTURE ENGIN INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tei: (604) 255-1169 Fax: (60 design@designdialog.ca

Fax: (604) 255-1790 CIVIL ENGINEER

ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGIN INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790

SEAL

![](_page_22_Picture_21.jpeg)

This document has been digita certified with digital certificate a encryption technology authorized t the Architectural Institute of BC an the Engineers and Geo The authoritative origination n can be relied upor a true copy of the original whe supplied by the architect, bearing images of the professional seal and digital certificate, or when printed from the digitally-certified electronic file provided by the architect.

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# LAYOUT PLAN

DRAWN: PLOT DATE: 1/28/21

CHECKED:

PH1-A1.02

![](_page_23_Figure_0.jpeg)

# **KEYNOTE LEGEND**

# CANOPY

C1 Primary Structure - Structural Steel Frame Painted finish, White

- Exposed Mass Timber

- Tempered, Laminated
- Raised off wood frame with SS Stand-offs

![](_page_23_Picture_9.jpeg)

![](_page_23_Picture_10.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT

![](_page_23_Picture_14.jpeg)

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOT VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTAN' FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGIN INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (60 design@designdialog.ca Fax: (604) 255-1790

CIVIL ENGINEER ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGINE INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790

![](_page_23_Picture_24.jpeg)

This document has be certified with digital cer encryption technology authorized the Architectural Institute of BC a the Eng The aut a true copy of the original whe supplied by the architect, bearing images of the professional seal and digital certificate, or when printed from the digitally-certified electron file provided by the architect

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# CANOPY PLAN

DRAWN: PLOT DATE: 1/28/21

CHECKED:

PH1-A1.03

# **KEYNOTE LEGEND**

# **1** HYDROGEN STORAGE CONTAINER

- Hydrogen Storage Cylinders
- Compressor Module

- steel mesh panels, ptd.

# 2 ELECTROLYZER CONTAINER

- Electrical Room
- Electrolyzer
- Supporting Equipment
- steel mesh panels, ptd.

# 3 **BIOSWALE / DETENTION BASIN**

- Natural safety buffer

# CANOPY

4

- painted, white
- spread coating
- steel stand-offs

![](_page_24_Picture_25.jpeg)

EAST ELEVATION

Scale: 1:100

2

THUNDERBIRD BLVD

(WESTBOUND)

BIKE

GREENWAY PATH (STREET CROSSING)

VEHICLE FORECOURT (HYDROGEN FUELING)

STORAGE CONTAINER

(5)

SIDEWAL

Date: 12/4/20 Time: 1:14:13 PM File name: BC100018.

- Concrete pad foundation with 3m Safety Zone - Factory painted, vinyl wrapped graphics on ends - Mechanical Screen: Steel frame, with perforated

- Factory painted, vinyl wrapped graphics on ends - Mechanical Screen: Steel frame, with perforated

- Filters discharge water from electrolyzer process - Retains water for slow infiltration

- Structural steel frame / columns (primary structure),

- Exposed mass timber framing, treated with flame

- Tempered glass panels, laminated, on stainless

THUNDERBIRD PARKADE (EXIT LANES)

![](_page_24_Picture_43.jpeg)

![](_page_24_Picture_44.jpeg)

![](_page_24_Picture_45.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT

![](_page_24_Figure_49.jpeg)

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6 design@designdialog.ca Fax: (604) 255-1790

CIVIL ENGINEER ASSOCIATED ENGINEERII Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGII INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Fax: (604) 255-1790 Tel: (604) 255-1169 design@designdialog.ca

![](_page_24_Picture_58.jpeg)

digital certificate, or when printe the diait

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# **ELEVATIONS**

DRAWN: PLOT DATE: 1/27/21

CHECKED:

![](_page_24_Picture_65.jpeg)

![](_page_25_Figure_0.jpeg)

![](_page_25_Picture_18.jpeg)

![](_page_25_Picture_19.jpeg)

![](_page_25_Picture_20.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT

![](_page_25_Figure_24.jpeg)

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6 design@designdialog.ca Fax: (604) 255-1790

CIVIL ENGINEER ASSOCIATED ENGINEERII Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGII INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790

![](_page_25_Picture_33.jpeg)

digital certificate, or when printe the digita

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# **ELEVATIONS**

DRAWN: PLOT DATE: 1/27/21

CHECKED:

![](_page_25_Picture_40.jpeg)

![](_page_26_Figure_0.jpeg)

Mag 12/2/20 4:41:05 I ame: BC10 Date: -Time: -

![](_page_26_Picture_3.jpeg)

![](_page_26_Picture_4.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

D 01 FEB 2021 DEVELOPMENT PERMIT

![](_page_26_Picture_8.jpeg)

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHER VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTAN FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT

DIALOG BC ARCHITECTURE ENGI INTERIOR DESIGN PLANNING INC 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (6 design@designdialog.ca Fax: (604) 255-1790

CIVIL ENGINEER ASSOCIATED ENGINEERIN Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE ENGINE INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 design@designdialog.ca Fax: (604) 255-1790

![](_page_26_Picture_18.jpeg)

This document has be certified with digital ce encryption technology authorized b the Architectural Institute of BC and the Architecturer name the Engineers and Geoscient The authoritative original has n can be relied upon a true copy of the original when supplied by the architect, bearing images of the professional seal and digital certificate, or when printed from the digitally-certified electror file provided by the architect

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

# DEMO PLAN

DRAWN: PLOT DATE: 1/27/21

CHECKED:

PH1-D.01

![](_page_27_Figure_0.jpeg)

LANDSCAPE ARCHITECTURE SITE PLAN Scale: 1:100

# **ARCHITECTURE DESIGN**

The UBC Transportation Testbed Project is a new look at how sustainable energy sources will power our transportation options of the future. Utilizing an energy centre twinned with a vehicle refueling station, a new hub is being created adjacent to Thunderbird Parkade.

The design of the site seeks to complement the educational and engineering aspects with a circulation pattern that not only connects users through the area - allowing them access to a variety of educational opportunities - but also leads them to new areas for socialization. The central seating area will become a new stop in UBC's outdoor space network.

Complementing this will be a planting palette that seeks to retain nearby, mature trees while also creating a new vegetated groundplane. The planting will utilize a variety of indigenous and adapted ornamentals, and include drought tolerant and pollinator friendly species.

![](_page_27_Picture_8.jpeg)

![](_page_27_Picture_9.jpeg)

SOCIAL HEART

EDUCATIONAL HEART

ENERGY HEART

![](_page_27_Picture_14.jpeg)

![](_page_27_Picture_15.jpeg)

![](_page_27_Picture_16.jpeg)

![](_page_27_Picture_17.jpeg)

![](_page_27_Picture_19.jpeg)

![](_page_27_Picture_20.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

### ISSUED FOR

A 24 NOV 2020 100% SCHEMATIC DESIGN

B 01 FEB 2021 DEVELOPMENT PERMIT B 01 FEB 2021 DEVELOPMENT PERMIT NORMATION FOR INFORMATION FOR INFORMATION CONSTRUCTION DOCUMENTS DISCLAIMER

Construction documents consist of modified specifications and drawing: and include a compilation of changes made to the bid documents arisins from addenda, bid revisions and other negotiated changes (if any). Construction documents are substantially consistent with the contact documents, which consist of the original bid documents, addenda and b revisions. Contract documents will be used for interpretation where any differences between construction documents and contract documents

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

LL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

# **ARCHITECT & PRIME CONSULTANT**

DIALOG BC ARCHITECTURE ENGINEE INTERIOR DESIGN PLANNING INC. IN LENDR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (604) 255-1790 design@designdialog.ca

# CIVIL ENGINEER

ASSOCIATED ENGINEERING Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL ΜΕCHANICAL LANDSCAPE DESIGN LANDSCAPE DESIGIN DIALOB GA CRUTECTURE ENGINEERING INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tei: (604) 255-1160 Fax: (604) 255-1790 design@designdialog.ca

SEAL

This document has been digita certified with digital certificate and encryption technology authorized eers and Ge ov of the original supplied by the architect, bearing images of the professional seal a digital certificate, or when printed om the digita d by the archited

# UBC TRANSPORTATION TESTBED PHASE

# LANDSCAPE PLAN

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

![](_page_27_Picture_57.jpeg)

DRAWN: JG PLOT DATE: 1/30/21 \_1.00

CHECKED: JR

BC100018

![](_page_28_Figure_0.jpeg)

 $\left( \cdot \right)$  $\odot$ **F -** 1 

LEGEND

### TREE PROTECTION NOTES

1. Existing healthy trees over 10 cm caliper (diameter at breast height) on project site shall be retained as shown. Detailed recommendations for retention and protection during construction must be obtained from campus arborist

2. Any construction activities or grade changes within or adjacent to the root protection zone must be approved by the consultant and campus arborist.

Any pruning of branches or roots must be done by a certified arborist in conjunction with UBC campus arborist.

4. Only hand excavation or hydro-excavation shall be undertaken within critical root zone of trees to be retained, under direction of campus arborist.

5. Tree protection fencing must be built to standard shown here, or as listed in the UBC arborist guidelines. Tree protection shall be composed of wood post and frame fencing with snow fencing or mesh around it. Posts are to be driven into the ground to a depth of at least 600 mm at no more than 3 m on centre. Tree protection fencing is to be 1.8 m high.

6. Tree protection fencing is to be installed at a radius around the subject tree equivalent to the greater of the following two options: - the drip line of the tree canopy - a radius equal to 1 m per 8 cm of trunk diameter measure a

300 mm for trees of less than 15 cm trunk diameter

7. No vehicular access or material storage is permitted within the fence lines.

8. Additional tree protection strategies or interventions may be required as work progresses. Contractor to consult with UBC campus arborist.

# UBC STANDARD TREE PROTECTION DETAILS

![](_page_28_Figure_14.jpeg)

Existing Tree to be Retained

Existing Tree to be Removed

Tree Protection Fencing

FX 1.00 Tree Elevation

![](_page_28_Picture_19.jpeg)

![](_page_28_Picture_20.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

### ISSUED FOR

A 24 NOV 2020 100% SCHEMATIC DESIGN

B 01 FEB 2021 DEVELOPMENT PERMIT B 01 FEB 2021 DEVELOPMENT PERMITY

Construction documents consist of modified specifications and drawing and include a compilation of changes made to the bid documents arisis from addenda, bid revisions and other negoliated changes (if any), documents, which consist of the original bid documents, addenda and revisions. Contract documents will be used for interpretation where any

### METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

LL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTEI VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

# **ARCHITECT & PRIME CONSULTANT**

DIALOG BC ARCHITECTURE ENGINEE INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: design@designdialog.ca Fax: (604) 255-1790

# CIVIL ENGINEER

ASSOCIATED ENGINEERING

Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL ΜΕCHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTU 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: design@designdialog.ca Fax: (604) 255-1790

SEAL

This document has been digital certified with digital certificate and encryption technology authorized the Architectural Institute of BC a eers and Ge ov of the original whe upplied by the architect, bearing om the digital ed by the architect

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

**TREE MANAGEMENT/ PROTECTION PLAN** 

BC100018

DRAWN: JG PLOT DATE: 1/30/21

CHECKED: JR

![](_page_29_Figure_0.jpeg)

![](_page_29_Picture_3.jpeg)

![](_page_29_Picture_4.jpeg)

![](_page_29_Picture_5.jpeg)

PLANTING ZONES

SHRUB LAYER W/ VARIED LOCAL SPECIES GRASSES / GROUNDCOVERS / LOW SHRUBS

# CONCEPTUAL PLANTING

The planting for the project will comprise and mix of indigenous species, adapted ornamentals, and those that reflect the temperate rainforest of the local region. A changing climate means that many of the species have been chosen to allow for shifts in planting zones and growing season days in the future. A focus on biodiversity and habitat value will also be built in to the extent possible, and deciduous and evergreen materials have been chosen to allow for all-season interest. The planting will be drought tolerant to reduce overall outdoor water use, and also include other guides such as beneficial wildlife foraging attributes. To build interest and delight, flowering species, those with colour, and a variety of textures will also be included.

# SAMPLE PLANTING CHARACTER IMAGES

![](_page_29_Picture_14.jpeg)

![](_page_29_Picture_16.jpeg)

![](_page_29_Picture_21.jpeg)

![](_page_29_Picture_22.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

### ISSUED FOR

A 24 NOV 2020 100% SCHEMATIC DESIGN

A 24 NUV 2020 100% SCHEMATIC DESIGN B 01 FEB 2021 DEVELOPMENT PERMIT FOR INFORMATION FOR INFORMATION FOR INFORMATION B 01 FEB 2021 DEVELOPMENT PERMIT

ents consist of modified specification and include a compilation of changes made to the bid from addenda, bid revisions and other negotiated char Construction documents are substantially consistent w nents, which consist of the original bid doct

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTE VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT DIALOG BC ARCHITECTURE ENGINEE INTERIOR DESIGN PLANNING INC.

INTLERIUM UESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER ASSOCIATED ENGINEERING

Suite 610-1632 Dickson Ave Kelowna, B.C, V1Y 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL LANDSCAPE DESIGN DIALOG BC ARCHITECTURE INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tel: (604) 255-1169 Fax: (604) 255-1790 design@designdlalog.ca

This doc ertified with digital ce

SEAL

om the digita

DROUGHT/URBAN TOLERANT

BIOSWALE

CHECKED: JR

# CONCEPTUAL PLANTING ZONES

DRAWN: JG PLOT DATE: 1/30/21

BC100018

L1.02

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

UBC TRANSPORTATION TESTBED PHASE 1

![](_page_30_Figure_0.jpeg)

± 1/30/21 e: 4:45:57 PM ™™e: 2001021 I Date: ' Time:

Scheduled Size	Remarks
#3	
#3	
#3	
#3	
#3	
#3	
#5	
#2	
#5	
#2	
#3	
#3	
#1	
#1	
#3	
#2	
	Scheduled Size #3 #3 #3 #3 #3 #4 #5 #2 #5 #2 #4 #5 #2 #4 #3 #4 #4 #1 #1 #1 #3 #2 #2 #2 #2 #3 #3 #3 #4 #1 #1 #4 #1 #4 #4 #4 #4 #4 #4 #4 #4 #4 #4 #4 #4 #4

![](_page_30_Picture_3.jpeg)

![](_page_30_Picture_4.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

# ISSUED FOR

A 24 NOV 2020 100% SCHEMATIC DESIGN

A 24 NOV 2020 100% SCHEMATIC DESIGN B 01 FEB 2021 DEVELOPMENT PERMIT FOR INFORMATION FOR INFORMATION B 01 FEB 2021 DEVELOPMENT PERMIT FOR INFORMATION FOR INFORMATION FOR INFORMATION CONSTRUCTION DOCUMENTS DISCLAIMER CONSTRUCTION DOCUMENTS DISCLAIMER

Construction documents consist of modified specifications and drawin and include a complation of changes made to the bid documents arise from addends, bid revisions and other negotiated changes (if any). Construction documents are substantially consistent with the contract documents, which consist of the original bid documents, addenda and revisions. Contract documents will be used for interpretation where an differences between construction documents and contract documents.

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

# ARCHITECT & PRIME CONSULTANT

 AIACOTT & TOTALE CONSECUTION

 DIALOG BC ARCHITECTURE ENGINEERING

 INTERIOR DESIGN PLANNING INC.

 406 - 611 ALEXANDER STREET

 VANCOUVER, BC, V6A 1E1

 Tel: (604) 255-1169

 Fax: (604) 255-1790

 design@designdialog.ca

STRUCTURAL ELECTRICAL MECHANICAL

SEAL

ASSOCIATED ENGINEERING Suite 610-1632 Dickson Ave Kelowna, B.C, V1V 7T2 Tel: (250)763-3638 inquiries@ae.ca

IVIEUTIANIUCAL LANDSCAPE DESIGN DIALOB EC ARCHITECTURE ENGINEERING INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, VGA 1E1 Tal: (604) 255-1199 design@designdiatog.ca

This document has t ertified with digital certifier

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

PLANTING PLAN

L1.03

DRAWN: JG PLOT DATE: 1/30/21

BC100018

upplied by the architect, bearin rom the digital

led by the architect

CHECKED: JR

CIVIL ENGINEER

![](_page_30_Picture_36.jpeg)

![](_page_30_Picture_37.jpeg)

![](_page_30_Picture_38.jpeg)

![](_page_30_Picture_39.jpeg)

![](_page_31_Figure_0.jpeg)

Date: 1/30/21 Time: 4:45:58 PM Ella name: 2001021 |

![](_page_31_Picture_9.jpeg)

![](_page_31_Picture_10.jpeg)

# THE UNIVERSITY OF BRITISH COLUMBIA

### ISSUED FOR

A 24 NOV 2020 100% SCHEMATIC DESIGN

A 24 NUV 2020 100% SCHEMATIC DESIGN B 01 FEB 2021 DEVELOPMENT PERMIT FOR INFORMATION FOR INFORMATION FOR INFORMATION B 01 FEB 2021 DEVELOPMENT PERMIT

Construction documents consist of motified specifications and drawing and include a compilation of changes made to the bid documents arisis from addenda, bid revisions and other negotiated changes (if any). Construction documents are substantially consistent with the contract documents, which consist of the original bid documents, addenda and revisions. Contract documents will be used for interpretation where any differences between construction documents and contract documents, with contract the original bid documents, addenda contract documents addenda contract documents and the contract documents addenda contract documents and soft and the contract documents addenda contract documents and soft and contract documents addenda contract documents and contract documents and soft and contract documents addenda and bid addenda addenda

# METRIC

THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSIO

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED VERIFY DIMENSIONS. DO NOT SCALE THIS DRAWING.

REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.

DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT

DIALOG BC ARCHITECTURE ENGINEERING INTERIOR DESIGN PLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, VGA 1E1 Tel: (604) 255-1169 Fax: (604) 255-1790 design@designdialog.ca

CIVIL ENGINEER

ASSOCIATED ENGINEERING Suite 610-1632 Dickson Ave Kelowna, B.C, V1V 7T2 Tel: (250)763-3638 inquiries@ae.ca

STRUCTURAL ELECTRICAL MECHANICAL VIEUTIANICAL LANDSCAPE DESIGN DIALOS 6C ARCHITECTURE ENGINEERING INTERIOR DESIGN FLANNING INC. 406 - 611 ALEXANDER STREET VANCOUVER, BC, V6A 1E1 Tai: (604) 255-1169 Fax: (604) 255-1790 design@designdlalog.ca

SEAL

This document has t ertified with digital certific encryption technology aut upplied by the architect, bearing from the digita ed by the architect

CHECKED: JR

UBC TRANSPORTATION TESTBED PHASE 1

6085 Thunderbird Blvd, Vancouver, BC V6T 2A1

CONCEPTUAL

L1.04

DRAWN: JG PLOT DATE: 1/30/21

BC100018

LIGHTING PLAN

![](_page_32_Picture_0.jpeg)

# UBC TRANSPORTATION TESTBED PROJECT

![](_page_33_Picture_0.jpeg)

UBC Transportation Testbed Schematic Design January 2021

**ALDRICHPEARS** ASSOCIATES

# Table of Contents

# 1 Introduction....

- 1.1 What is this [
- 1.2 Project Goals
- 1.3 Audience .
- 1.4 Project Site

# 2 Interpretive Approac

- 2.1 Themes and S
- 2.2 Thematic Cor
- 2.3 Content Distr
- 2.4 Text Approac

# 3 Design Approach..

- 3.1 Site Overview
- 3.2 Design Appro

# 4 Content Matrix . . .

5 Next Steps . . . . .

Document?	
s	
ch	;
Subthemes	1
ncept	
ribution	ł
ch	,
	,
N	,
oach	,
	)
	,

# 1 Introduction

# 1.1 WHAT IS THIS DOCUMENT?

This document represents the Final Schematic Design for exhibit design at the UBC Transportation Testbed Project. It builds on feedback received on the Draft Schematic Design submitted November 26, 2020 and subsequent meetings and discussions with the project architects and the UBC project team.

![](_page_36_Picture_3.jpeg)

Project Site – View of the site as currently seen from Thunderbird Blvd.

# **ABOUT THE PROJECT**

As a global leader in climate action, the University of British Columbia (UBC) uses its land, assets and utilities as hubs for sustainability research and innovation. It is in this context that the university is implementing a project called the Clean, Connected and Safe Transportation Testbed.

Unrolling over multiple phases and sites, the project is a city-scale, living laboratory exploring the connections between sustainable energy, transportation and urban design. As one piece of the larger project, the Transportation Testbed site will connect solar panel arrays (Phase 2) to electric vehicle chargers (Phase 0) and hydrogen generation and fueling infrastructure (Phase 1) to support research into carbon-neutral fuel production.

The ultimate goal of this site will be to promote breakthroughs in transportation and energy storage infrastructure that help generate new technologies, business models and best practices for Canadian and international markets.

To support this, the project must also interpret this innovative infrastructure and engage students and the public with its larger research purpose and impact. AldrichPears Associates was hired to develop a plan for exhibits that link to existing sustainability messaging on campus and are flexible enough to keep up with evolving needs of the site.

# **1.2 PROJECT GOALS**

The Transportation Testbed site supports the following institution-wide goals at UBC by:

- Taking advanced research out of UBC's labs and placing it into the public realm as part of campus operations.
- Providing a platform for UBC's innovative research into sustainability and climate action-areas of critical importance for BC, Canada and the world.
- Supporting the university in lowering the carbon footprint of transportation on campus.

In order to communicate the impact of this project, interpretive experiences at the Transportation Testbed will need to:

- Reveal hidden and/or hard to understand infrastructure and processes.
- Be flexible enough to keep pace with changing technology and the evolving features of the project.
- Provide intuitive, visually compelling entry points into the story of energy flow, movement and transformation.
- Reveal the story over a variety of scales and in various conditions, from large-scale infographics to discrete interpretive panels, from daytime to night.
- Connect to visitors on an emotional level and through everyday examples relevant to their lives.
- Be compelling for broad audiences—interpretation must be intuitive, visually compelling and simple but not dumbed down.
- Leave visitors with a sense of optimism about the future of clean energy and UBC's role in innovating it.

# **1.3 AUDIENCE**

The interpretive program at the Transportation Testbed will need to consider that many visitors to the site will be engaging with this research and associated technological innovations for the first time. While exhibits should aim to engage and spark curiosity in visitors of all ages, backgrounds and abilities, specific groups will have slightly different needs and requirements:

# **UBC Students**

![](_page_36_Picture_27.jpeg)

# **General Public**

The general public will engage with the site both as casual visitors and as part of campus tours aimed at everyone from elementary school groups to adults interested in sustainability. These diverse audiences may have more time to engage with interpretation but have differing levels of comprehension. Interpretation should provide easy to understand entry points into technological innovations and relevant everyday examples.

# **Existing/Potential Research Partners**

Research and industry partners will likely arrive at the site as part of a tour and have some preexisting knowledge of the project. These groups will be interested in experiences that complement the tour experience and provide a comprehensive snapshot of how the system works together and its potential long-term benefits for specific sectors.

# **UBC Staff and Faculty**

Whether they are Applied Science professors or UBC staff from other disciplines, this group will be excited to explore the active research happening on site, its outcomes and how it is being communicated to broad audiences.

From law students to fine art students, this group will be rushing to and from class and will have limited time to interact with exhibits. Interpretation must be intuitive, visually compelling and layered to engage this group. Seating may also encourage this group to hangout and learn a little bit more about what's happening at the site.

# **1.4 PROJECT SITE**

Located in and around the Thunderbird Parkade at University of British Columbia's Vancouver campus, the project site is accessed by a pedestrian walkway from the north near the Pharmaceutical Sciences Building and the Campus Energy Centre or from Thunderbird Boulevard to the south.

Visitors in vehicles will approach the site from Thunderbird Boulevard, pulling up and out of traffic to use the Hydrogen Fueling Station. Directly adjacent, the site will continue to be animated by a well-used skate park.

Once complete, the site will consist of the following linked infrastructure, some of which will be visible to visitors arriving by foot and by vehicle:

- A. 1-megawatt Photovoltaic (PV) Array
- B. Battery Energy Storage System
- C. E-House
- D. 10 Electric Vehicle (EV) Chargers
- E. Electrolyzer
- F. Hydrogen Compressor and High Pressure Hydrogen Storage
- G. Hydrogen Fuel Dispenser
- H. Transformer

On the roof of the Thunderbird Parkade, the PV Array will collect energy for conversion into electricity. From the PV Array, electricity will follow through multiple paths and be used for different purposes.

Electricity produced by the PV Array can be:

- Stored in battery form until needed
- Used to power the new EV Charging Stations located inside the Thunderbird Parkade
- Used to split water into hydrogen and oxygen in the Electrolyzer

Once produced, hydrogen will be:

• Stored and dispensed as needed at the Hydrogen Dispenser

![](_page_37_Picture_19.jpeg)

# 2 Interpretive Approach

# **2.1 THEMES AND SUBTHEMES**

A theme is a single sentence representing one clear idea. More than a topic, it presents a perspective or commentary on a topic. The main theme has an important role to play in any interpretive site. Although it is never explicitly stated to the visitor, it articulates the dominant idea or impression that the visitor will leave with—no matter how much or how little of the interpretation they engage in. The main theme must be broad enough that all the topics can feed into it, yet clear enough that it provides focus to the visitor's experience. Subthemes support the main theme and help organize the topics and messages.

# **Transportation Testbed Themes**

# Main Theme:

As part of a city-scale research project, the UBC Transportation Testbed is producing clean, connected, safe energy for our transportation needs and helping us plan the cities of the future.

# Subthemes:

# A clean energy conversion system

This Transportation Testbed is transforming renewable energy into clean fuels to reduce the carbon footprint of transportation at the university and beyond.

# A testbed for transferable solutions

The Transportation Testbed uses the campus as a sandbox to explore and test new ideas in the real-world to create viable, scalable solutions.

# A collaborative research project

The collaborative research taking place on this site is shaped by input from UBC researchers, industry partners and people like you.

# 2.2 THEMATIC CONCEPT

The thematic concept takes cues from the themes to shape the overall narrative flow and visitor experience at the Transportation Testbed site.

# Approaching the Testbed

Walking from the north end of the site, visitors are introduced to the Testbed project as a site of city-scale innovation and are invited to follow the flow of energy, from the PV Array above to the E-House below, and onwards across the site. Visible infrastructure guides the experience and sparks curiosity to learn more. Concepts of movement and transformation are intuitively and visually communicated.

# Testbed Education Hub

The path leads to the central interpretive hub that highlights the Transportation Testbed project as a site of innovation, active research and problem solving. This testbed education hub, links two narratives—technology and people—and provides a space to gather, get oriented and delve deeper into the social impacts and aspirations of the project. It provides an ideal gathering point for drop-in visits or planned tours.

![](_page_38_Picture_19.jpeg)

# 2.3 CONTENT DISTRIBUTION

This distribution plan maps key messages—that support the themes and subthemes onto the site. Determining messaging for each area helps to focus visitors' attention on one idea at a time, and allows us, to some degree, to influence how visitors relate ideas to each other. The content distribution proposed here draws inspiration from the site plan, and aims to use what visitors see around them to help them understand the ideas being discussed and make their own connections.

For more details on the specific storylines and content for each location see the Content Matrix in Section 4.

![](_page_39_Picture_3.jpeg)

**Project Site** – Path towards site as seen from plaza

![](_page_39_Picture_5.jpeg)

**Project Site** – Inside Thunderbird parkade

# 1 – Project Introduction (Secondary)

• This is a city-scale testbed that is transforming renewable energy into clean fuels—and helping find clean, connected and safe solutions to our transportation needs.

# • Innovative research is happening here.

the Testbed site.

![](_page_39_Picture_11.jpeg)

# 2 – Pedestrian Walkway & Parking Facade

• Follow the flow of energy, water and fuel through

# 3 – PV Arrays

• Linking renewable energy like solar power to the production of clean fuels is a key innovation of the Testbed.

# 4 – EV Chargers

• As part of the Testbed system, bidirectional EV Chargers are transforming how cars might function in the future turning them from polluters into power storage devices.

# 5 – E-House

• This E-house monitors and optimizes the energy flow through the Testbed, allowing it to respond smartly to demand and use.

# 11 – System Overview

• Using sunlight, water and grid energy as inputs, the Testbed produces clean fuels of the future using innovative, connected technologies.

# 12 – Electrolyzer

- Water is being split into hydrogen and oxygen inside this structure.
- While it's not the only possible clean fuel of the future, there are many benefits to hydrogen fuel that make it a good case study for the Testbed project.

ovation Overview	13 – Hydrogen Compressor & Storage
Jht fuel life on Earth—but De the key to cleaner	• Hydrogen is stored here at high pressures until it is needed at the Testbed's Hydrogen Dispenser.

# 2.4 TEXT APPROACH

This text approach considers and responds to the specific needs of the identified audiences, and includes reading level, text hierarchy and voice. Clear language, brevity, and a mid-range reading level allow a maximum number of people to understand, and enjoy, the text. Even readers who are able to read at higher levels will often select a lower reading level for pleasure.

Clear language means using short sentences free of unnecessary adverbs, passive constructions or technical jargon. Brevity is important in interpretive copy. Visitors encounter this text in a setting that is not conducive to reading—on average, a visitor spends less than 45 seconds viewing an interpretive panel, and they tend to not even approach panels with a daunting amount of text. It is always better to leave a visitor wanting more than feeling overwhelmed.

# VOICE

One unifying narrative voice will guide visitors through the Testbed site. The voice of the text will use the tone and style of a passionate researcher who understands the critical importance of the Testbed to solving global transportation problems. The voice is eager to share their knowledge, always linking stories to real-world impacts and relevant everyday examples.

# **USER-FRIENDLY LANGUAGE**

Language will be simple and informal to make it easier for visitors to enjoy a casual learning experience. Text will be as concise as possible. More complex ideas will be conveyed with the support of images and graphics.

# DIRECT ADDRESS

Direct address engages visitors, reminding them that we are interpreting the world they live in. Direct address helps visitors feel interpretation was developed with them in mind. We use the second person and the first person plural (you, we).

# COMPARISONS

A comparison to something familiar can help visitors form mental pictures of things that may at first seem complicated or unfamiliar. Comparisons can be visual or narrative (e.g., "Picture an ant-like robot the size of your fingernail").

# **READING LEVEL**

Text will use an accessible reading level. Where more complex terms are used in the text, they will be defined within the body of the text.

# QUESTIONS

Questions will be used strategically to help visitors connect Testbed innovations to their daily lives and the bigger picture. Questions will capture their attention, engage them in conversation, and encourage self reflection.

# **TEXT HIERARCHY**

Most visitors want to choose what they read and to what extent. Providing a clear hierarchy of text will allow visitors that choice. Brevity of copy encourages visitors to engage with the text. The layers of text and their approximate length include:

# Title

Grabs the visitor's attention and introduces the key idea of the panel. Often this will come in the form of a question. (3-7 words)

# Précis

in (15-30 words)

# Body

# Sidebar

(25-75 words)

# Captions

Various combinations of these text components may be used in different types of interpretive panels.

A short sentence or two that uses an interesting fact or question to draw the visitor

Focuses on one key idea (up to 100 words)

Provides opportunities to convey little-known facts or captivating stories that relate to the key idea. These often connect the Testbed technology to its real-world impacts.

Describe photos or illustrations (20-40 words)

# SAMPLE TEXT

# [Project Introduction]

# [Title]

# **Transforming Our Transportation**

# [Précis]

What if our cars and fueling stations were the building blocks for clean, connected cities?

# [Body]

Welcome to the UBC Transportation Testbed, a living lab where we're using renewable energy to make clean fuel—and transforming how our cities run. Explore the site to find out how.

# [Spotlight on the System Panel - EV Chargers]

[Title]

# **From Polluter to Powerhouse**

# [Précis]

What if instead of just using energy, your car could help power the city?

# [Body]

We're conducting an experiment inside the Thunderbird Parkade in front of you. Ten unique EV chargers inside are part of a system that's feeding solar and grid energy into electric cars. But power doesn't just flow one way. In the future, the system's bidirectional chargers could let your smart car inject energy back into the electrical grid—turning it into a battery on wheels. This would let you charge your car at night when demand is low and feed power back into the grid during the day when demand is high. The result? An electrical grid that's more stable and efficient for everyone.

# [Sidebar]

The impacts of UBC's solar-powered EV chargers aren't hypothetical, they're having real-world effects.

# Reducing greenhouse gases

By powering around xx cars per day, we're keeping xx [tons] of greenhouse gases out of the air. That's the same as impact as [planting x.x million trees] or [saving x.x million dollars in health costs related to air pollution.]

# Building a business case

Every time you use these EV chargers you're adding to our knowledge about the system and how we can improve it. More data means more opportunity to transfer systems like this to other cities.

# 3 Design Approach

# 3.1 SITE OVERVIEW

The design approach links interpretive elements—textural graphic patterns, bold infographics and discrete interpretive panels-to specific spots at the Testbed. Strategically located, these interpretive elements draw attention to what visitors see in front of them revealing hidden or hard to understand processes and providing key background information about the goals and impacts of the research happening on site.

![](_page_42_Figure_3.jpeg)

- Primary Introduction

- Electrolyzer

# Spotlight on the System

- Hydrogen Compressor & Storage

# **Folded Container Signage**

- Hydrogen Compressor & Storage

# **Container Graphics**

**EV Charger** Graphics

- Hydrogen Compressor & Storage

# **Reader Rail**

- Innovation Overview

### **DESIGN APPROACH** 3.2

# 3.2.1 Design Approach

Interpretive elements at the Testbed site use the following techniques to engage a broad audience, from tour groups to passersby:

- An eye-catching colour palette that signals something special is happening at the site
- Playful shapes and patterns that provide clues to the processes happening on site and encourage visitors to explore the site to find out more
- An illustration style that identifies the site components, visually linking them together as parts of a single system
- Diagrams that provide simplified, easily accessible entry points into the complex processes taking place

# 3.2.2 Colour Palette

Cool, crisp, fresh colours along the blue-green spectrum along with a burst of yellow were chosen to highlight the Testbed's connection to water, sunlight and clean energy and its future-thinking aspirations.

# Primary Colours

![](_page_43_Figure_10.jpeg)

PMS Cool Gray 1 PMS 282 (50%)

# Secondary Colours

![](_page_43_Figure_13.jpeg)

# 3.2.3 Typefaces

The Korolev font was chosen for headings because of its crisp, clean and friendly character.

Korolev – Headings

# abcdefghijklmnopqrstuvwxyz ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

# abcdefghijklmnopqrstuvwxyz ABCDEFGHIJKLMNOPORSTUVWXYZ 1234567890

Myriad Pro was chosen for its impeccable readability and diverse family of fonts.

Myriad Pro – Subheads, Body Text, Captions

# abcdefghijklmnopgrstuvwxyz ABCDEFGHIJKLMNOPORSTUVWXYZ 1234567890

abcdefghijklmnopqrstuvwxyz ABCDEFGHIJKLMNOPORSTUVWXYZ 1234567890

abcdefghijklmnopqrstuvwxyz ABCDEFGHIJKLMNOPORSTUVWXYZ 1234567890

Just like a text hierarchy helps guide visitors through the story, a consistent graphic hierarchy builds on visitor expectations about where and how to learn more. The hierarchy layers information. Stories move from general to specific, first establishing the broader context, themes, and logic of the interpretive site experience. Then drilling down, revealing relationships among and between the stories.

A standard of graphic types and levels of interpretation ensures visitors need only learn the system once. They can focus on the stories instead of needing to decipher a new hierarchy of information every time they encounter a graphic panel at the Testbed.

# 3.2.4 Graphic Hierarchy and Typicals

# A Project Introductions

Tall, double-sided panels provide a high-level introduction to the Testbed project at two key locations.

Header + Précis + Body Copy ~ 50 words

*Key message:* This is a city-scale testbed that is transforming renewable energy into clean fuels—and helping find clean, connected and safe solutions to our transportation needs.

![](_page_44_Picture_4.jpeg)

# **Project Introductions**

- Secondary Introduction

![](_page_44_Picture_8.jpeg)

Project Introductions
- Primary Introduction

### Folded Container Signage В

Header text and a bold splash of colour identify the components that make up the Testbed.

*Key message for all:* This structure is part of the Testbed.

![](_page_45_Picture_3.jpeg)

### **Container Graphics** С

These graphic elements provide visual clues to the processes happening inside the containers, using a series of striking icons. These graphics are intended to discourage tagging and vandalism of the Testbed containers.

![](_page_45_Picture_6.jpeg)

# E-House

*Key message:* Innovative processes are happening inside this structure.

Container signage bends over the top of the container

![](_page_45_Picture_10.jpeg)

![](_page_45_Figure_11.jpeg)

# **Container Graphics**

![](_page_46_Picture_1.jpeg)

# Hydrogen Compressor & Storage

*Key message:* Innovative processes are happening inside this structure.

Container signage bends over the top of the container

![](_page_46_Picture_5.jpeg)

![](_page_46_Figure_7.jpeg)

# **Container Graphics**

- Hydrogen Compressor & Storage

![](_page_46_Picture_10.jpeg)

3

### D System Overview

A large-scale diagram provides an overview of how the Testbed's components work together, emphasizing the flexibility of the system.

Header + Précis + Captions

Key messages: Using sunlight and water as inputs, the Testbed produces clean fuels of the future using innovative, connected technologies.

It is a uniquely flexible system that can be adapted to other cities and contexts.

# **Container Graphics**

![](_page_47_Figure_6.jpeg)

# Electrolyzer

*Key message:* Innovative processes are happening inside this structure.

Container signage bends over the top of the container

![](_page_47_Picture_10.jpeg)

- Electrolyzer

![](_page_47_Picture_13.jpeg)

# **Container Graphics**

![](_page_48_Picture_1.jpeg)

# Battery Energy Storage System

*Key message:* Innovative processes are happening inside this structure.

![](_page_48_Picture_4.jpeg)

*Note*: This container signage may or may not bend over the top of the container. TBD in next phase.

![](_page_48_Picture_7.jpeg)

Container Graphics
- Battery Energy Storage System

### Pedestrian Walkway & Parkade Facade Е

Intriguing shapes and patterns on the Pedestrian Walkway provide clues to the research happening at the Testbed site. Some of these shapes, patterns and/or colours extend onto the facade of the Thunderbird Parkade, encouraging visitors to look upwards to the PV Array on the roof. Note that the facade piece will be further developed for Phase 2 of the project.

Key message: Innovative research is happening here.

![](_page_49_Picture_3.jpeg)

explored in the next phase.)

![](_page_49_Picture_5.jpeg)

**Projections - TBD** F

Projected shapes and patterns could animate the underside of the Hydrogen Dispenser canopy. Key message: Innovative research is happening here.

![](_page_49_Picture_8.jpeg)

![](_page_49_Picture_9.jpeg)

![](_page_49_Picture_11.jpeg)

# G Hydrogen Dispenser Graphics

A bright colour and header text identify the hydrogen fuel dispenser as part of the Testbed.

*Key message:* Is this the fueling station of the future?

![](_page_50_Picture_3.jpeg)

![](_page_50_Picture_4.jpeg)

![](_page_50_Picture_6.jpeg)

Hydrogen Dispenser Graphics - Electrolyzer

### Spotlight on the System Panels н

Discrete graphic panels located across the site provide a deeper dive into the innovations of key aspects of the Testbed system.

Background colour on panel

Header + Précis + Body Copy + Sidebar (120 words)

# Electrolyzer

*Key message:* Water is being split into hydrogen and oxygen inside this structure. While it's not the only clean fuel of the future, there are many benefits to using hydrogen as a transportation fuel for our vehicles.

# Hydrogen Compressor & Storage

Key message: Hydrogen is stored here at high pressures until it is needed at the Testbed's Hydrogen Dispenser.

# **Battery Energy Storage System**

Key message: The ability to store solar energy in electrochemical form makes the Testbed flexible and stable.

# E-House

Key message: This E-house monitors and optimizes the energy flow through the Testbed, allowing it to respond smartly to demand and use.

# EV Chargers

Key message: As part of the Testbed, bi-directional EV Chargers are transforming how cars might function in the future-turning them from polluters into active power storage.

# PV Arrays

*Key message:* Linking renewable energy like solar power to the production of clean fuels is a key innovation of the Testbed.

![](_page_51_Figure_15.jpeg)

dive into content

# I Reader Rail

A large reader rail panel highlights the Testbed's high-level goals and how it is re-imagining the uses of water and sunlight in creating clean fuel and redefining our relationships with transportation, cities and the world

Header + Précis + Body Copy + Sidebar (150 words)

*Key messages:* Water and sunlight fuel life on Earth—but could they also be the key to cleaner transportation?

![](_page_52_Picture_4.jpeg)

Graphic can bend like Container Signage and Spotlight on the System Panels

![](_page_52_Picture_6.jpeg)

![](_page_52_Picture_8.jpeg)

**Reader Rail** - Innovation Overview

# J EV Charger Graphics

Bold, playful graphics distinguish the Testbed's EV chargers from others on the UBC campus, linking them visually to the rest of the Testbed site.

*Key message:* These EV chargers are part of the UBC Transportation Testbed.

![](_page_53_Picture_3.jpeg)

![](_page_53_Picture_4.jpeg)

Graphics mounted to parkade walls

![](_page_53_Picture_6.jpeg)

![](_page_53_Picture_7.jpeg)

**EV Charger Graphics** 

# M Water Feature and Seating

A water feature highlights the role of water at the Testbed. Integrated graphic elements evocatively hint at the elements at play at the site, encouraging visitors to learn more.

Key messages: This is a place to recharge, literally and figuratively.

The Testbed makes energy out of light, water and "breath" — all things necessary to recharge, or refuel, life on Earth.

![](_page_54_Picture_4.jpeg)

![](_page_54_Picture_5.jpeg)

![](_page_54_Picture_6.jpeg)

![](_page_54_Picture_7.jpeg)

![](_page_54_Picture_8.jpeg)

![](_page_54_Picture_9.jpeg)

![](_page_54_Picture_10.jpeg)

Interpretive elements can be embedded in the seating.

![](_page_54_Picture_13.jpeg)

Water Feature and Seating

# 4 Content Matrix

At the Schematic Design stage, the focus of the Content Matrix is grouping the key points and messages that will be communicated through individual interpretive panels and graphics. In the subsequent design phase, these groupings will be used to produce draft and final interpretive text for these graphics.

Matrix terms:

**Location:** Where will these stories be told?

**Key Messages:** What are the main ideas that visitors will walk away with, that will support the themes and subthemes?

**Content:** What are the key points that support the messages?

Visitor Experiences: What do visitors see, do and feel?

Media: What physical tools will be used to convey the content?

Location /	Key Messages	Content	Visitor Experience	Media
imastructure				
1. Project Introduction (Secondary)	Welcome to the UBC Transportation Testbed This is a city-scale testbed that is transforming renewable energy into clean fuels—and helping find clean, connected and safe solutions to our transportation needs.	<ul> <li>Transforming Our Transportation         <ul> <li>Welcome to the UBC Transportation Testbed, a city-scale experiment that is transforming renewable energy into clean fuels—and helping find clean, connected and safe solutions to our transportation needs.</li> <li>Explore the site to find out more!</li> </ul> </li> </ul>	<ul> <li>A graphic panel introduces passersby to the site and the project. They are invited to explore the site to learn more.</li> </ul>	<ul> <li>Project Introduction Panel - Secondary Introduction</li> </ul>
2. Pedestrian Walkway & Parkade Facade	Innovative research is happening here. Follow the flow of energy, water and fuel through the Testbed site.	See key messages	<ul> <li>Intriguing shapes and patterns on the Pedestrian Walkway provide clues to the research and processes happening at the Testbed site.</li> <li>Some of these shapes, patterns and/or colours extend onto the facade of the Thunderbird Parkade, encouraging visitors to look upwards to the PV Array on the roof.</li> </ul>	<ul> <li>Pedestrian Walkway Graphics</li> <li>Graphic Treatment for Parkade Facade TBD</li> </ul>
3. PV Arrays	Linking renewable energy like solar power to the production of clean fuels is a key innovation of the Testbed.	<ul> <li>Solar Power in Raincouver</li> <li>Look up. Solar panels on the roof of this parkade are part of the Testbed system. They are collecting energy and converting it into clean fuel—electricity at the Testbeds's EV chargers and hydrogen at the Refuelling Station.</li> <li>Linking renewable energy like this to the production of clean fuels, is a key innovation of the Testbed system.</li> <li>But why solar power? And why in Vancouver? Solar energy is a mature industry with a lot of existing data to work from, making it a tried, tested and affordable (with dramatic recent cost reductions) solution to test an innovative system.</li> <li>In this project, solar power is a proxy for other renewable energy sources. This means the Testbed uses a collection of flexible technology that can be tailored and customized to cities around the globe, depending on the context and available resources.</li> </ul>	<ul> <li>A graphic panel on the pedestrian walkway highlights and interprets the role of solar arrays in the Testbed system. A QR code provides the opportunity to provide a deeper dive into the research and technology being used here.</li> </ul>	<ul> <li>Spotlight on the System Panel - PV Array</li> </ul>
4. EV Chargers	As part of the Testbed system, bi-directional EV Chargers are transforming how cars might function in the	<ul> <li>From Polluter to Power Storage</li> <li>As part of the Testbed system, the EV chargers above use electricity produced by solar panels on the parkade roof and from the grid.</li> </ul>	• A graphic panel on the pedestrian walkway highlights and interprets the role of the EV chargers in the Testbed system. A QR code provides the	<ul> <li>Spotlight on the System Panel - EV Chargers (along the Pedestrian Walkway)</li> </ul>

Location /	Key Messages	Content	Visitor Experience	Media
Infrastructure				modia
	future—transforming them from polluters into power storage devices.	<ul> <li>Some of the chargers are bidirectional, meaning in the future they would allow your car to inject energy back into the electrical grid when needed—turning your car into a connected, power storage device.</li> <li>Your car could be charged during low demand periods (night, etc.) and stored power could be fed power back into the grid during high demand periods, making the grid more stable and efficient for everyone.</li> <li>This flattening of peaks and valleys in energy consumption helps reduce power shortages, reduce air pollution and improves overall efficiency.</li> </ul>	<ul> <li>opportunity to provide a deeper dive into the research and technology being used here.</li> <li>Inside the parkade, these EV charging stations use a distinct graphic treatment to distinguish them from others on campus.</li> </ul>	• EV Charger Graphics (inside the parkade)
5. E-house	This E-house monitors and optimizes the energy flow through the Testbed, allowing it to smartly respond to demand and use.	<ul> <li>An Energy Conductor</li> <li>Like a traffic conductor, the Energy Management System inside this box directs the right amount of energy at the right time, to different parts of the Testbed system.</li> <li>Depending on use and availability it can direct energy from the PV arrays and the grid to: the system's battery (to store for later use), EV chargers (to power electric vehicles on campus) or the electrolyzer (to produce hydrogen fuel).</li> <li>It has remote monitoring capabilities; so we can adjust flow from desktops elsewhere. And by monitoring the flow we can optimize it, making it as efficient as possible.</li> <li>This helps researchers dial in the system, making it a valuable case study and a potential transferable solution for other cities.</li> <li>Sidebar story: Overview of the role of the the nearby Transformer</li> </ul>	<ul> <li>A folded ID sign and graphic treatments on two ends of the container identify the E-house.</li> <li>A graphic panel on the pedestrian walkway highlights and interprets the role of the E-house in the Testbed system. A QR code provides the opportunity to provide a deeper dive into the research and technology being used here.</li> </ul>	<ul> <li>Folded Container Signage - E-House</li> <li>Container Graphics - E-House</li> <li>Spotlight on the System Panel - E-House</li> </ul>
6. Battery Energy Storage System	The ability to store solar energy in electrochemical form makes the Testbed system flexible and stable.	<ul> <li>Storing Energy for Stability <ul> <li>The Testbed's solar panels collect sunlight and transform it into electricity.</li> <li>But they can only make energy when the sun is shining (and it rains a lot in Vancouver). That's why the ability to store solar energy for later use is important.</li> <li>This battery energy storage system allows us to store energy until it is needed, flattening peaks and valleys in energy consumption and making this system more stable.</li> </ul> </li> </ul>	<ul> <li>An ID sign and a graphic treatment on two ends of the container identify the Battery Energy Storage System.</li> <li>A graphic panel along the pedestrian walkway highlights and interprets the role of the Battery Energy Storage System in the Testbed system. A QR code provides the opportunity to provide a deeper dive into the research and technology being used here.</li> </ul>	<ul> <li>Container Signage - Battery Energy Storage System</li> <li>Container Graphics - Battery Energy Storage System</li> <li>Spotlight on the System Panel - Battery Energy Storage System</li> </ul>
7. Project Introduction (Primary)	Welcome to the UBC Hydrogen Transportation Testbed	<ul> <li>Transforming Our Transportation</li> <li>Welcome to the UBC Hydrogen Transportation Testbed, a city-scale experiment that is transforming renewable energy into</li> </ul>	• A striking graphic panel provides a high level introduction to the Testbed system at the Testbed Education Hub.	<ul> <li>Project Introduction Panel - Primary Introduction</li> </ul>

Location / Infrastructure	Key Messages	Content	Visitor Experience	Media
	This is a city-scale testbed that is transforming renewable energy into clean fuels—and helping find sustainable solutions to our transportation needs.	<ul> <li>clean fuels—and helping find sustainable solutions to our transportation needs.</li> <li>Explore the site to find out more!</li> </ul>		
8. Hydrogen Dispenser	Is this the fueling station of the future?	<ul> <li>This Is Not a Gas Station</li> <li>The fuel pump you see here does not dispense gasoline—it is dispensing hydrogen that is being produced on site. Is this the fueling station of the future?</li> <li>Explore the site to find out more!</li> </ul>	<ul> <li>A graphic wrap on the hydrogen fuel dispenser provides clues to bigger themes at the Testbed site.</li> <li>Above, projections could potentially animate the underside of the station's canopy.</li> </ul>	<ul> <li>Hydrogen Dispenser Wrap</li> <li>Projections - TBD</li> </ul>
9. Water Feature and Seating	This is a place to recharge, literally and figuratively.	<ul> <li>The Testbed makes energy out of light, water and "breath" — all things necessary to recharge, or refuel, life on Earth.</li> <li>How do you see these elements manifested throughout the site and in your own experience of it?</li> <li>Evocative words/text might incorporate a line from Leanne Betasamosake Simpson: "trees make breath out of light" to evoke these ideas in a poetic and less literal way.</li> </ul>	<ul> <li>A water feature highlights the importance of water at the Testbed site.</li> <li>Graphic elements embedded in this area and/or in the bench seating evocatively hint at the elements at play in the Testbed, prompting visitors to learn more throughout the site.</li> </ul>	<ul> <li>Water Feature (by others)</li> <li>Seating (by others) with embedded graphics</li> </ul>
10. Innovation Overview	Water and sunlight fuel life on Earth—but could they also be the key to cleaner transportation?	<ul> <li>Water + Sun = The Future of Clean Transportation?</li> <li>Water and sunlight fuel life on Earth—but could they also be the key to cleaner transportation?</li> <li>Welcome to the UBC Transportation Testbed where we are experimenting with using sunlight and water to produce clean fuel and with new ways to charge electric cars.</li> <li>Innovating how we use these building blocks of life is just one way our Testbed researchers are imagining a cleaner, more connected future.</li> <li>From self-contained campus to city-scale lab <ul> <li>Living labs are physical spaces and human systems in the public realm where we can design, test, study, and learn from social and technical innovations in real time and real world contexts.</li> <li>As a living lab, the UBC campus is a perfect spot for experimentation: it is a self-contained city that owns and operates its own electricity and gas grids.</li> <li>It lets us test out new technologies and systems in a low-risk environment before cities adopt them elsewhere</li> </ul> </li> </ul>	<ul> <li>A large reader rail graphic provides an overview of the Testbed project, highlighting its high-level goals and how it is redefining how we see ourselves and the world. A QR code provides the opportunity to provide a deeper dive into the research and technology being used here.</li> </ul>	Reader Rail Graphic Panel

Location / Infrastructure	Key Messages	Content	Visitor Experience	Media
		<ul> <li>From static technology to smart systems         <ul> <li>There is no one-size-fits-all solution for clean transportation.</li> <li>This system takes features that once had only a single, static use—from our cars to buildings and recharging stations—and combines them as smart, flexible parts of an energy system.</li> <li>The Testbed is currently experimenting with how to use solar energy to produce clean fuels, but it could easily use wind or geothermal power. It uses a flexible model so it can be adapted to different contexts.</li> </ul> </li> <li>From local research to global collaborations         <ul> <li>The issues that affect our world, affect us all. In order to address global issues we must produce solutions that are viable and scalable to other contexts.</li> <li>Testing systems at a city-scale at this site allows other municipalities to customize and scale this research to their own needs.</li> <li>By inviting collaboration and participation from a broad cast of characters—governments to cities, industries, investors and utilities—we ensure the best possible data and outcomes.</li> </ul> </li> <li>From refueller to research assistant         <ul> <li>By fuelling here, you are reducing your GHG emissions by xx% over 1 year [and other relevant, easily understood</li> </ul> </li> </ul>		
		<ul> <li>stats]</li> <li>You are also helping produce valuable data that could make this system, or systems like it, a transferable solution for other cities around the world.</li> </ul>		
11. System Overview	Using sunlight, water and grid energy as inputs, the Testbed produces clean fuels of the future using innovative, connected technologies. It is a uniquely flexible system that can be adapted to other cities and contexts.	<ul> <li>A Flexible System         <ul> <li>The Testbed does not promote the adoption of a single energy source or technology.</li> <li>Rather is testing how an interchangeable kit of parts could be optimized and reconfigured for other contexts.</li> <li>Follow flow of energy and see how these parts work together, and how different technologies could be swapped in or out:                 <ul> <li>Sunlight + grid - Flexible and integrated power sources</li> <li>Overview of functions and processes involved</li> </ul> </li> </ul> </li> </ul>	<ul> <li>A simple, large-scale diagram provides an overview of the Testbed technology, emphasizing the interconnectedness, flexibility and transferability of the system.</li> </ul>	<ul> <li>System Overview Graphic</li> </ul>

Location /	Key Messages	Content	Visitor Experience	Media
Innastructure				
		<ul> <li>E-House - High-tech monitoring         <ul> <li>Overview of functions and processes involved</li> <li>Electrolyzer and PV Array - Clean fuel production                 <ul> <li>Overview of functions and processes involved</li> <li>Battery Energy Storage System + Hydrogen Compressor and Storage - Energy/fuel storage</li> <li>Overview of functions and processes involved</li> <li>Every Energy + Dispenser - Clean fuel distribution</li> <li>Overview of functions and processes involved</li> </ul> </li> </ul> </li> </ul>		
12. Electrolyzer	Water is being split into hydrogen and oxygen inside this structure. While it is not the only possible clean fuel of the future, there are many benefits to hydrogen fuel that make it a good case study for the Testbed project.	<ul> <li>Why Hydrogen?</li> <li>Solar and grid energy are used to extract hydrogen from water inside this electrolyzer. But what are the benefits of creating hydrogen?</li> <li>Hydrogen is a clean fuel (when produced via electrolysis with renewable energy). When hydrogen is consumed in a fuel cell car to generate electricity, the only emission is water vapour, no harmful greenhouse gases.</li> <li>And unlike in electric vehicles, it takes [minutes] to fill up a fuel cell car instead of [hours].</li> <li>But why not just use electricity and batteries? Trucks, trains, ships, and airplanes need a lot of energy per trip. Hydrogen fuel cells can link renewable electricity to uses where batteries aren't enough or would have to be too big to fuel a vehicle.</li> <li>Compressed hydrogen is much more dense than a battery in an EV, allowing fuel cell vehicles to go farther with a smaller "tank."</li> </ul>	<ul> <li>A folded ID sign and graphic treatments on two ends of the container identify the Electrolyzer.</li> <li>A graphic panel explains the role of the electrolyzer in the Testbed system and the benefits of hydrogen fuel in general. A QR code provides the opportunity to provide a deeper dive into the research and technology being used here.</li> </ul>	<ul> <li>Folded Container Signage - Electrolyzer</li> <li>Container Graphics - Electrolyzer</li> <li>Spotlight on the System Panel - Electrolyzer</li> </ul>
13. Hydrogen Compressor and Storage	Hydrogen is stored here at high pressures until it is needed at the Testbed's Hydrogen Dispenser.	<ul> <li>Under Pressure <ul> <li>This structure is part of the UBC Transportation Testbed; it stores hydrogen, produced by the electrolyzer, at high pressures until it is needed at the Dispenser.</li> <li>Hydrogen is an extremely light, low-density gas. If this storage unit were to use atmospheric pressure to store hydrogen, it would need to be xx times bigger, or the size of a [appropriate everyday example].</li> <li>By compressing hydrogen, we are able to squeeze it into smaller tanks.</li> <li>This storage unit(s) contains hydrogen at two pressures: the higher pressure has greater density and is used for small passenger vehicles where space is at a premium and lower pressure is used for larger medium and heavy duty vehicles like buses. When full,</li> </ul> </li> </ul>	<ul> <li>A folded ID sign and graphic treatments on two ends of the container identify the Hydrogen Compressor and Storage unit.</li> <li>A graphic panel interprets how and why hydrogen is being stored at the Testbed site. A QR code provides the opportunity to provide a deeper dive into the research and technology being used here.</li> </ul>	<ul> <li>Folded Container Signage - Hydrogen Storage</li> <li>Container Graphics - Hydrogen Storage</li> <li>Spotlight on the System Panel - Hydrogen Storage</li> </ul>

# UBC Transportation Testbed Content Matrix

Location / Infrastructure	Key Messages	Content	Visitor Experience
		<ul> <li>this storage unit(s) contains enough hydrogen to fuel xx cars and xx medium/heavy duty vehicles.</li> <li>Like all fuels, hydrogen has some risks and needs to be handled with care. However, with the proper systems we can manage these risks. To ensure safety, the system uses [specialized leak detection and ventilation elements].</li> </ul>	

	Media		

# 5 Next Steps

This document represents the Final Schematic Design for interpretation at the UBC Transportation Testbed. All feedback received from the UBC project team will be carried forward into the next phase of design — Design Development, at which point individual interpretive components will be designed and draft and final text will be written.

For more information contact: Anna Wilkinson Content Developer

302-1930 Pandora Street Vancouver, BC, Canada V5L 0C7 Phone: 604-398-2929 Email: awilkinson@aldrichpears.com

# ALDRICHPEARS ASSOCIATES