

UW West Campus Utility Plant

UWAC DESIGN GUIDANCE MEETING

17 FEBRUARY 2015



An Opportunity to Set a New Standard of Excellence

PROJECT SUMMARY

PROJECT PRIORITIES

1. **MAXIMIZE CAPACITY:** Chilled Water and Emergency Power in both Phase 1 & 2
2. **ARCHITECTURAL INTEGRITY:** Campus Gateway & Fit with the West Campus Framework Plan
3. **SUSTAINABILITY:** Opportunity to further UW's Commitment to Sustainability

SCHEDULE

Phase I Substantial Completion - February 2017

Interim Milestone - November 2016 to deliver chilled water to ARCF for commissioning

Reminder that this is Phase I of two-phase plant development

FUNDING

\$ 30.5 M Initial Budget for Phase I West Campus Utility Plant

\$ 5.7 M Value-Added Enhancements

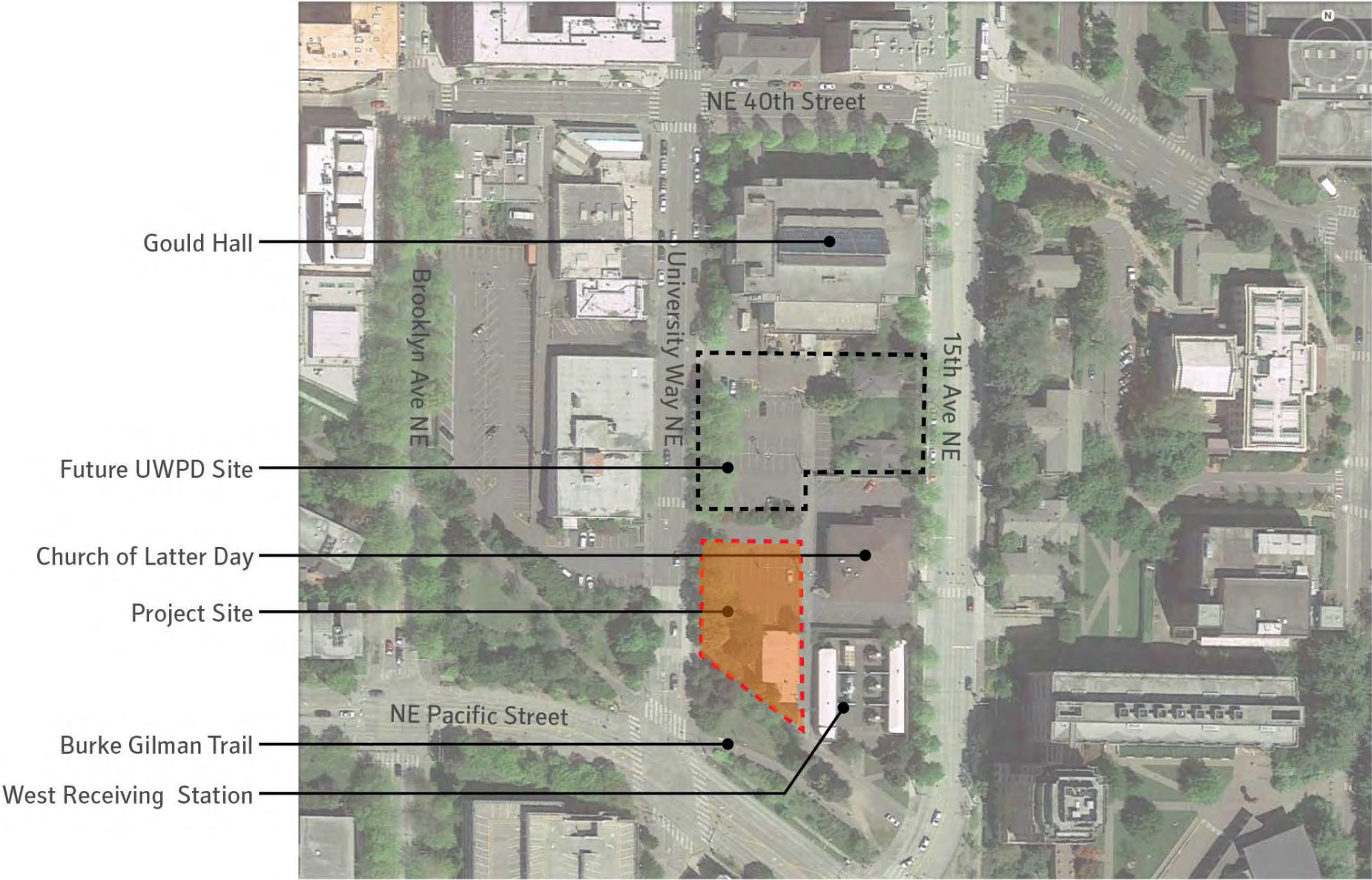
\$ 36.2 M Total Project Budget

PROGRESSIVE DESIGN/BUILD DELIVERY METHOD

This is a brand new delivery model for the UW....many eyes are on the project

What's the STORY we want to tell after the project is complete?

WCUP PROJECT SITE



TODAY'S AGENDA

RECAP OF 11/6/14 UWAC/ULAC MEETING

BUDGET/SCOPE ALIGNMENT

WHERE WE ARE NOW

1. ENGINEERING UPDATE
2. SITE ANALYSIS & OPPORTUNITIES
3. BUILDING ORGANIZATION & MASSING
4. SCREEN/WRAPPER CHARACTER

NEXT STEPS

The team expects to present a comprehensive strategy for the site and building advanced to early-DD Level at our next meetings:

ULAC - March 26th

UWAC - March 30th

PREVIOUS MEETING RECAP

ENGINEERING – SERVICES & LOADS

SERVICES

- Chilled water for comfort and process cooling
- Emergency and standby power

LOADS

- Animal Care and Research Facility (ARCF)
- Existing campus loads with stand-alone cooling and emergency/standby power generation (centralization of equipment & maintenance)
- Future South and West Campus loads

PHASES

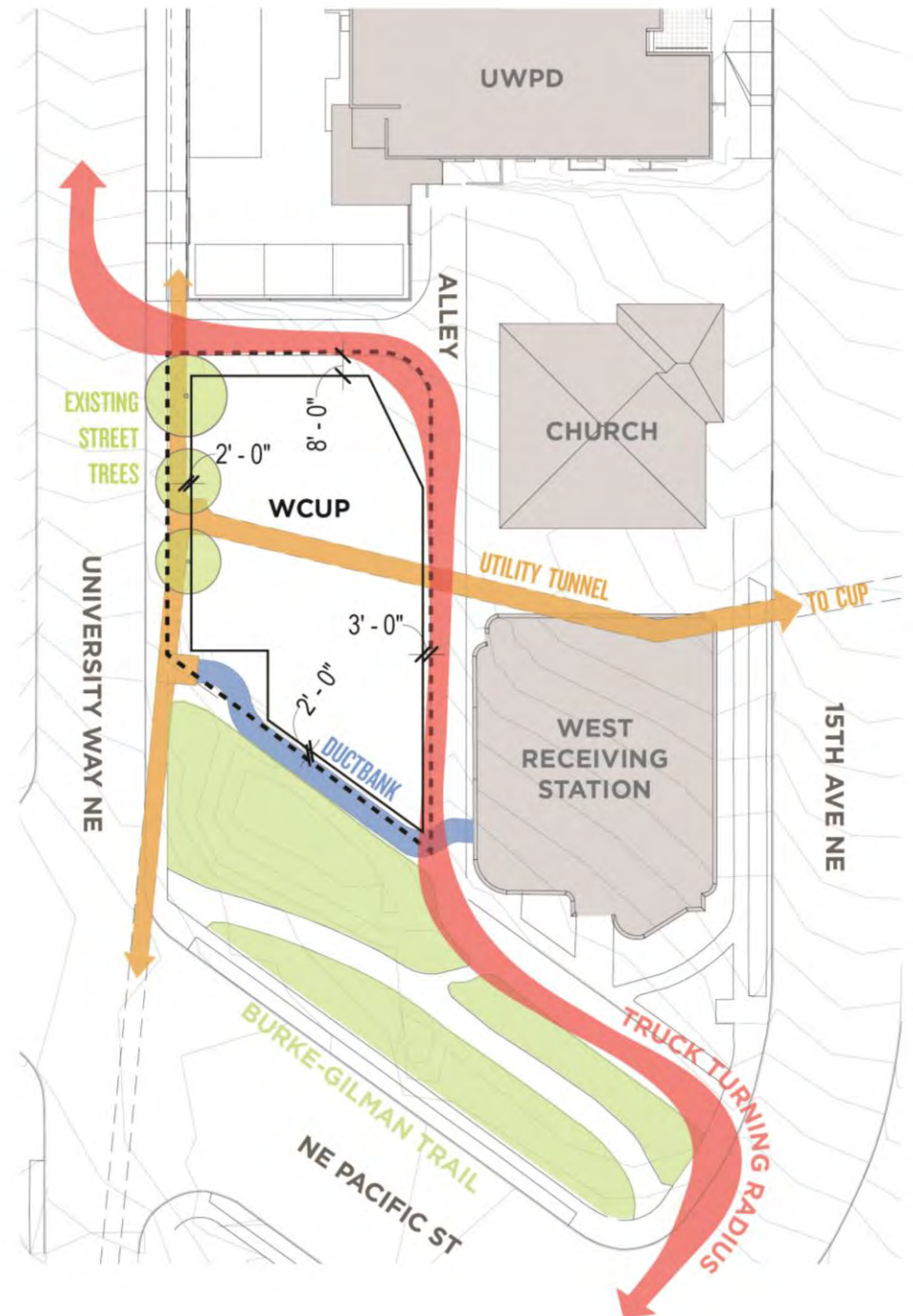
- Phase 1 (this project)
- Phase 2 (future project)



SITE ANALYSIS

KEY CONSTRAINTS

- **WEST:** North leg of utility tunnel to Gould Hall; South leg to South Campus
- **NORTH:** Alley setback, building screening, truck turning radius
- **EAST:** Alley setback, truck turning radius
- **SOUTH:** UW ductbank + SCL 26kV Service to West Receiving Station
- **ONSITE:** Utility Tunnel to Central Plant; Power Poles adjacent to alley; truck turning radii



CLEAR ORGANIZATION OF SYSTEMS

+64' TOP OF SCREEN WALL

WET SIDE

DRY SIDE

65' MAXIMUM HEIGHT

+28' ROOF

COOLING TOWERS

RADIATORS

36' CLEAR

CHILLERS

GENERATORS

WINDOW INTO THE PROCESS

+4' GRADE

20' CLEAR

PUMPS

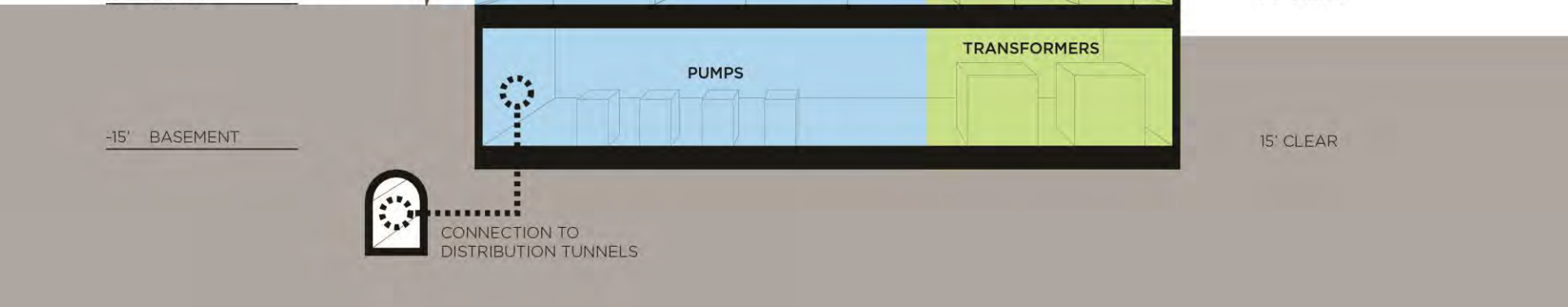
TRANSFORMERS

-15' BASEMENT

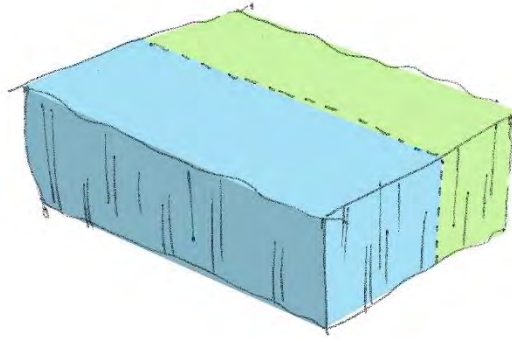
15' CLEAR



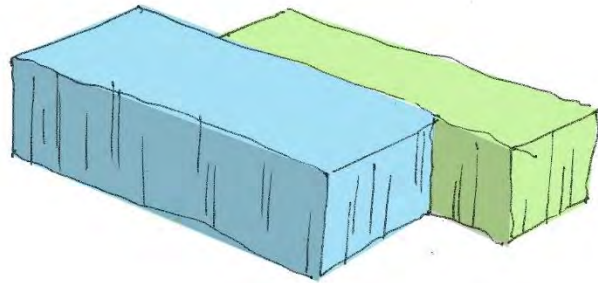
CONNECTION TO DISTRIBUTION TUNNELS



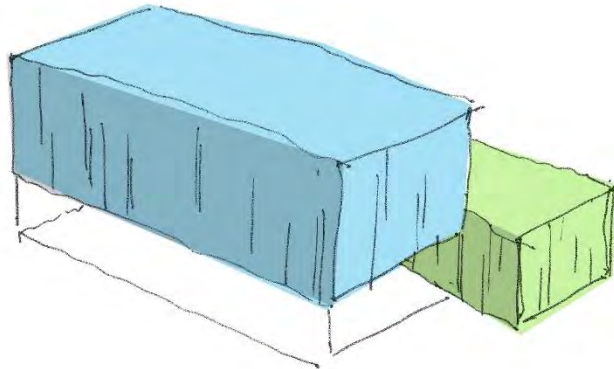
INITIAL MASSING CONCEPT



SLICE



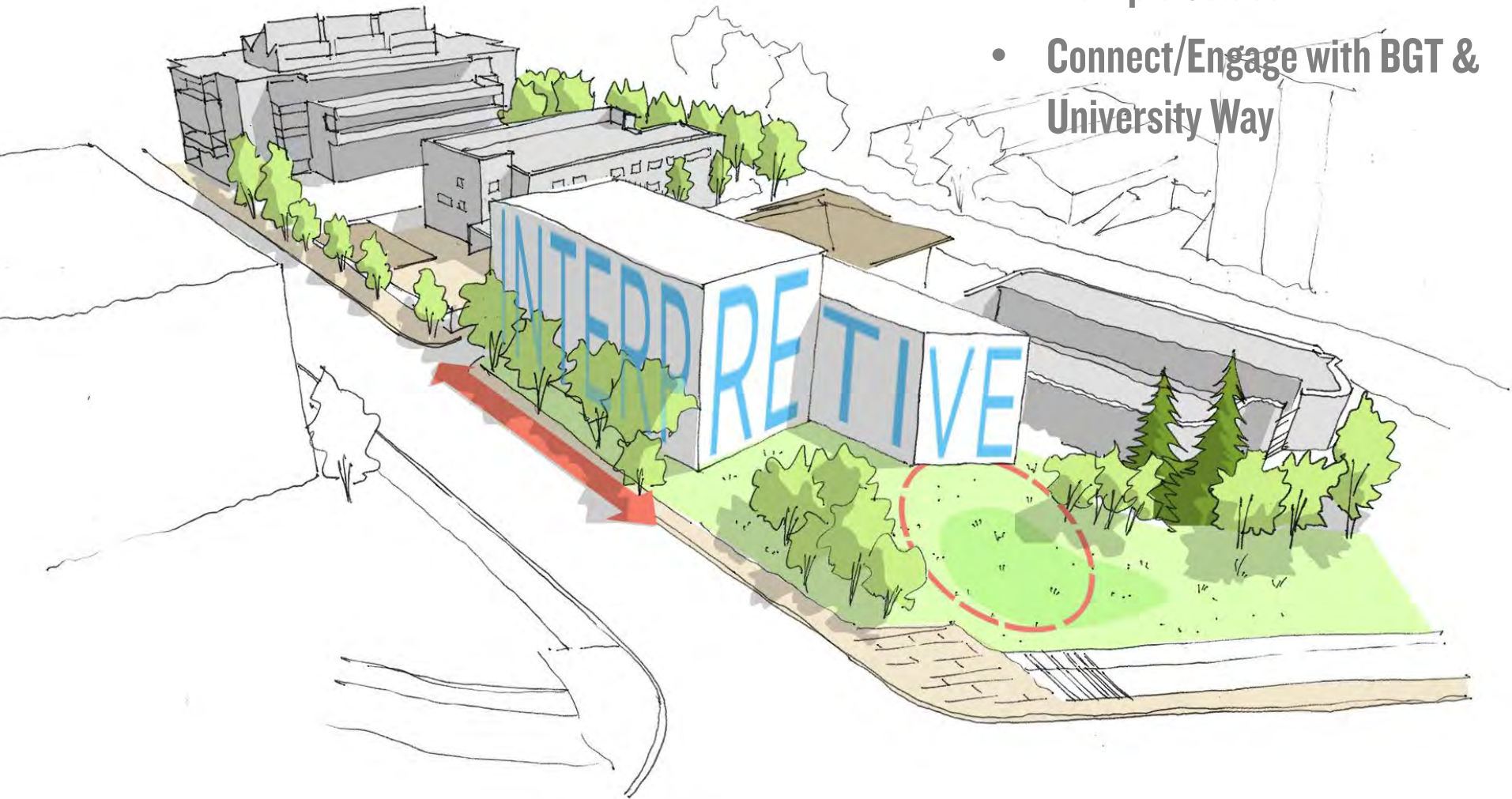
SLIDE



ELEVATE

BUILDING MASSING – INTERPRETIVE OPPORTUNITIES

- Integrate Building Facades with Interpretive/Display at Multiple Scales
- Connect/Engage with BGT & University Way



NOTES FROM UWAC/ULAC ONLINE PRESENTATION - 11/6/14

FOCUS OF PRESENTATION

1. ENGINEERING OPTIONS/DRIVERS
2. SITE ANALYSIS & OPPORTUNITIES
3. BUILDING ORGANIZATION & MASSING
4. SUSTAINABILITY OPPORTUNITIES

SUMMARY OF YOUR COMMENTS

- Sectional Clarity Of Systems & Building Organization Seemed Strong – Suggest Investigating Stacking Equipment As A Means To Be More Efficient
- Breaking Down The Overall Building Mass Is Helpful In The Project Context
- Team Should Work To Save The Trees Along University Avenue If Possible
- Reinforce The Character Of University Way Through Thoughtful Landscaping
- Project Is A Great Opportunity To Demonstrate UW's Broader Campus-wide Commitment To Sustainability
- Large Screen As “Billboard” Is A Way To Transform A Negatively Perceived Building And Make It Positive
- Windows Into The Process Along University Way Create A Better Pedestrian Experience

BUDGET/SCOPE ALIGNMENT

SCHEDULE OVERVIEW

DESIGN & CONSTRUCTION PROCESS

CONTRACT

WORK STAGES

TRADITIONAL PHASES

INTEGRATION NODES

SEPA

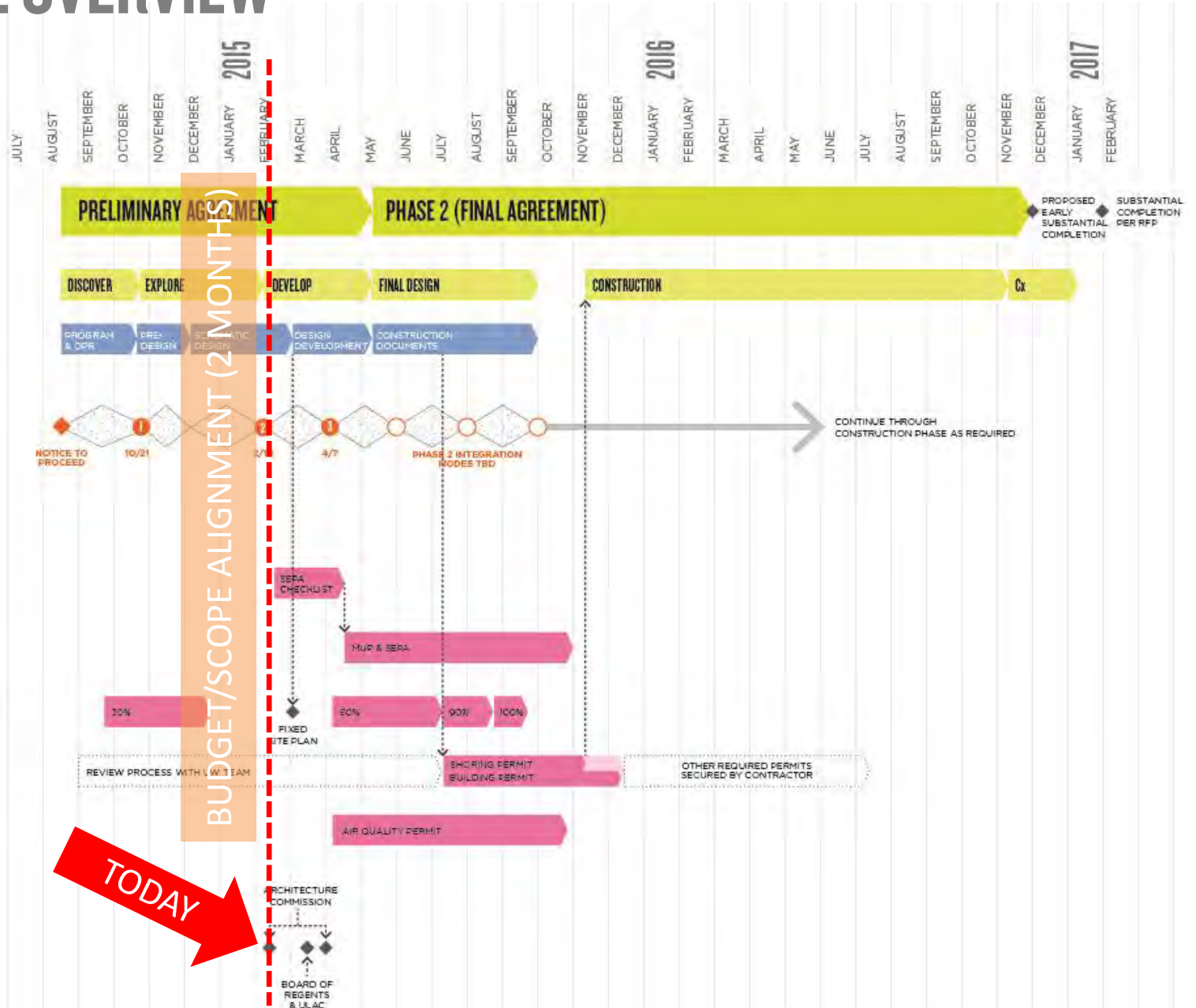
MASTER USE PERMIT

STREET IMPROVEMENT PERMIT

BUILDING PERMIT

AIR QUALITY PERMIT

UW APPROVALS



BENEFITS OF REDEFINED SCOPE OF WORK

PROCESS

- Leveraged strengths of Progressive Design-Build delivery
- Worked with UW to identify value added enhancements and additional funding for project

COMPETITIVE MARKET PRICING

- Mechanical and Electrical RFP – market review of Best Value Ideas
- Building configuration largely set from MEP systems and equipment

WCUP FACILITY

- Rooftop Generators: reduce building cost and more fully utilize roof area.
- 17,000 sf of useable area allows for maximum spatial efficiency
- 1,600 partial basement with direct connection to tunnel system
- Primary-Secondary pumping allows for future TES connection
- On-site emergency fuel storage allows (96) hours generator run time
- Transformers integrated into building footprint
- Increased building size provides flexibility for future equipment options

REDEFINED CORE SCOPE OF WORK

\$36.2MM TOTAL PROJECT COST

WEST CAMPUS UTILITY PLANT FACILITY

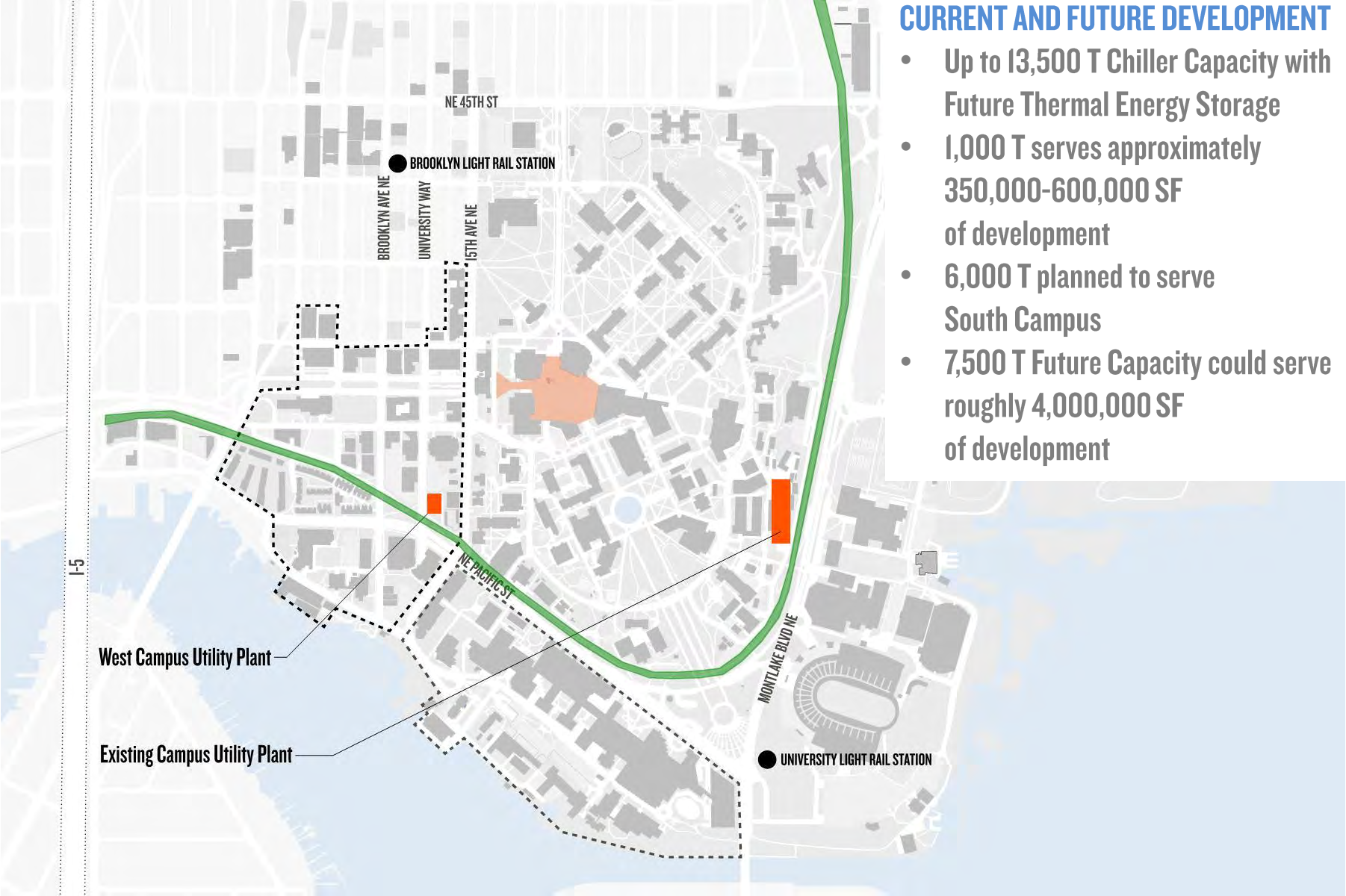
- Gateway architecture
- Interpretive element
- Optimizes building footprint in available site
- 3,000 Tons chilled water Day 1, 10,500 Tons full build-out
- Future TES connection equivalent to an additional 3,000 Tons
- 6MW, 12MW full build-out
- 1,500 Tons Water-Side Economizer capacity
- Allows for future Heat Recovery Chillers
- Direct connection from WCUP to tunnel for personnel access

DISTRIBUTION SYSTEM

- Chilled Water WT 5 to SW-1
- Emergency Power to feeder GD7 at SW1

WHERE WE ARE NOW

SUPPORTING FUTURE DEVELOPMENT



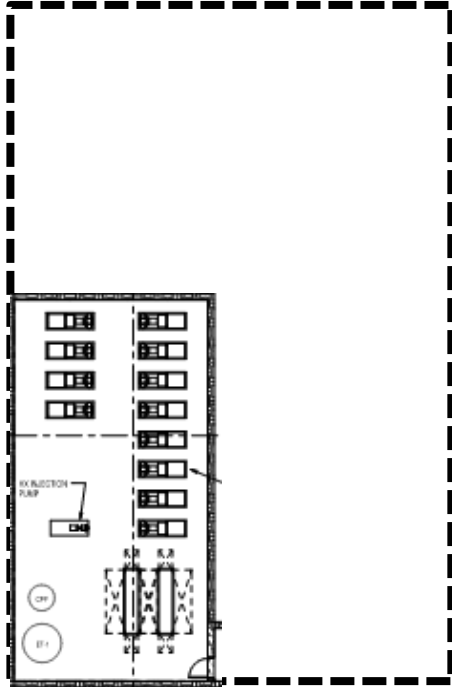
CURRENT AND FUTURE DEVELOPMENT

- Up to 13,500 T Chiller Capacity with Future Thermal Energy Storage
- 1,000 T serves approximately 350,000-600,000 SF of development
- 6,000 T planned to serve South Campus
- 7,500 T Future Capacity could serve roughly 4,000,000 SF of development

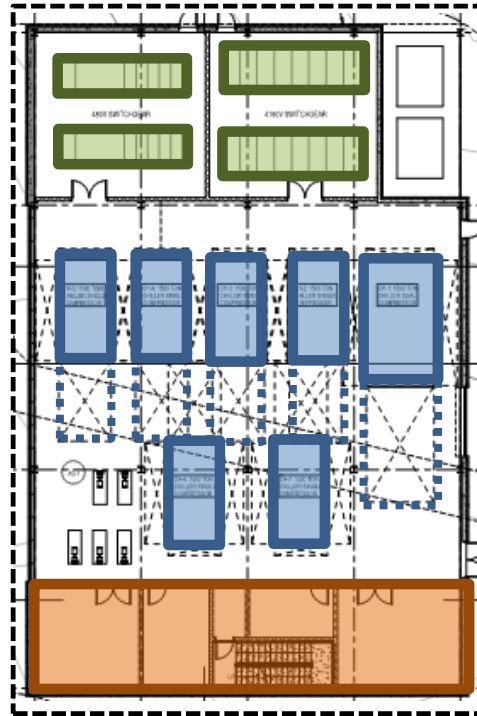
DESIGN PRINCIPLES

- Thoughtfully integrate UWCUP into the larger campus context
- Highlight the distinctly different characters of the Burke Gilman Trail and University Way
- Focus on the southwest corner; it works at both the regional/campus scale and the human scale
- Engage the public through “Windows into the Process” and a positive pedestrian experience along University Way
- Convey through architecture/landscape/interpretive program the concept of “TRANSFER” or “EXCHANGE”. Relates to the plant’s function, it’s connection to other buildings on campus and the exchange of services/ideas/info that are the hallmark of a higher ed institution.

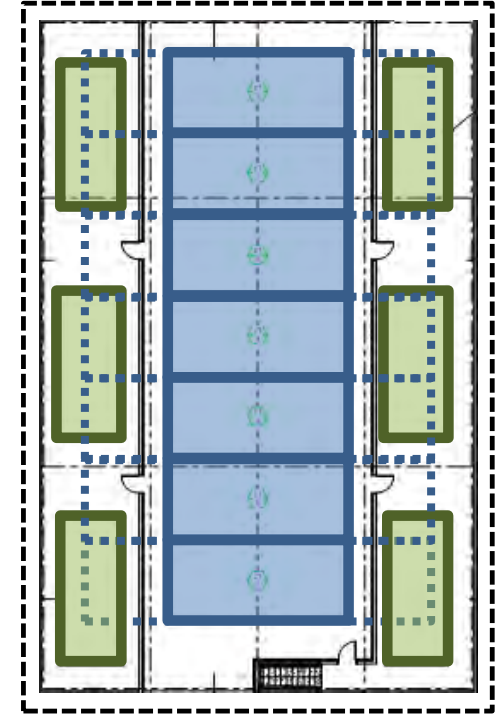
FUTURE BUILD OUT



PARTIAL BASEMENT PLAN



MAIN FLOOR PLAN



ROOF PLAN

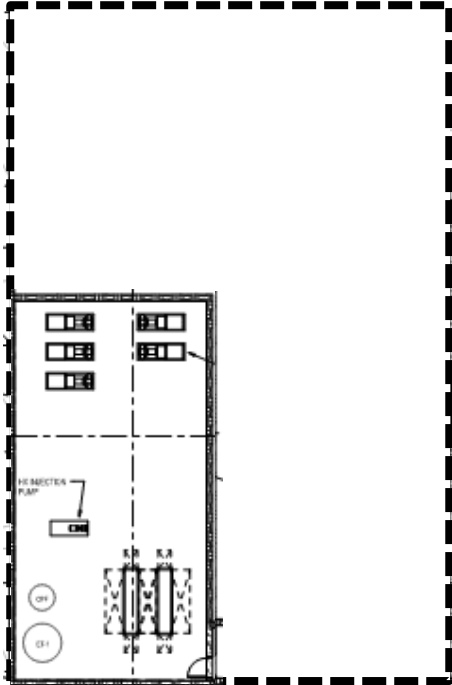
CHILLED WATER

- Chillers to support 10,500T total future capacity
- Ability to add Thermal Energy Storage for additional 3,000 T

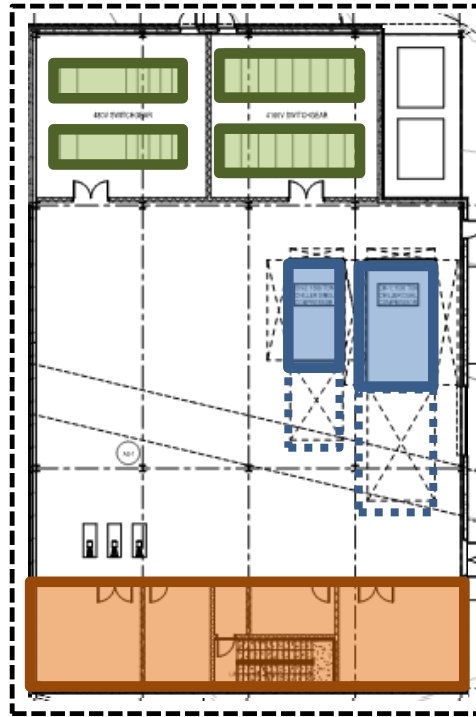
POWER GENERATION

- Future expansion to 12MW

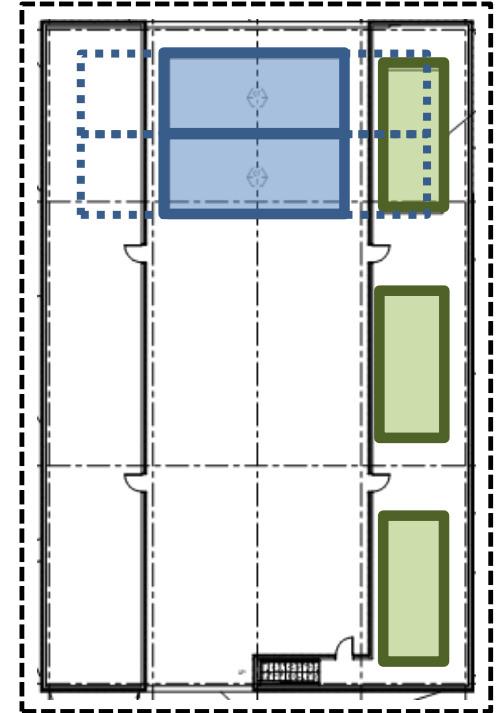
INITIAL INSTALL



PARTIAL BASEMENT PLAN



MAIN FLOOR PLAN



ROOF PLAN

CHILLED WATER

- Chillers to support 3,000T initial capacity

POWER GENERATION

- Generators to support 6MW initial capacity

CLEAR ORGANIZATION OF SYSTEMS

+63' TOP OF SCREEN WALL

65' MAXIMUM HEIGHT

+24' ROOF

39' CLEAR

-4' GRADE

20' CLEAR

-16' BASEMENT

14' CLEAR

WINDOW INTO THE PROCESS



CONNECTION TO DISTRIBUTION TUNNELS

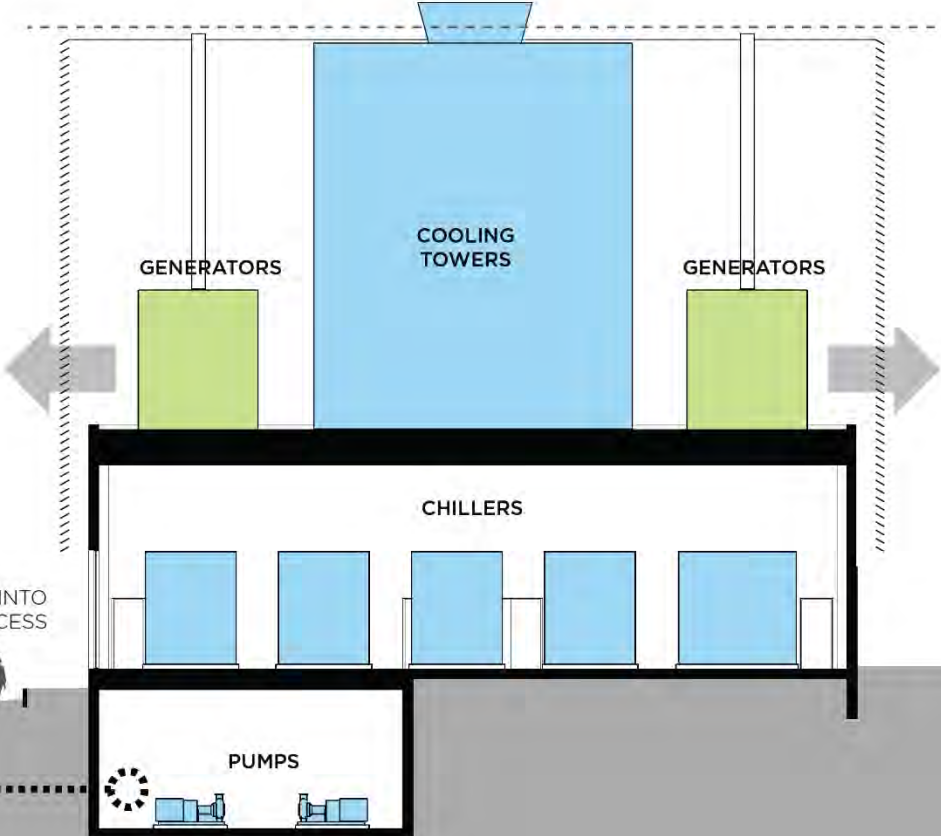
GENERATORS

COOLING TOWERS

GENERATORS

CHILLERS

PUMPS



MAXIMIZING CAPACITY

At 74'x110', the WCUP Plant is:

- As **SMALL** as it can possibly be while maximizing the capacity of chilled water and emergency power it provides to the South & West Campuses.
- As **BIG** as it can be working within the various site constraints and budget limitations.



TREES EVALUATED FOR PRESERVATION



UNIVERSITY WAY CONTEXT

EXISTING OAK



TULIP TREE



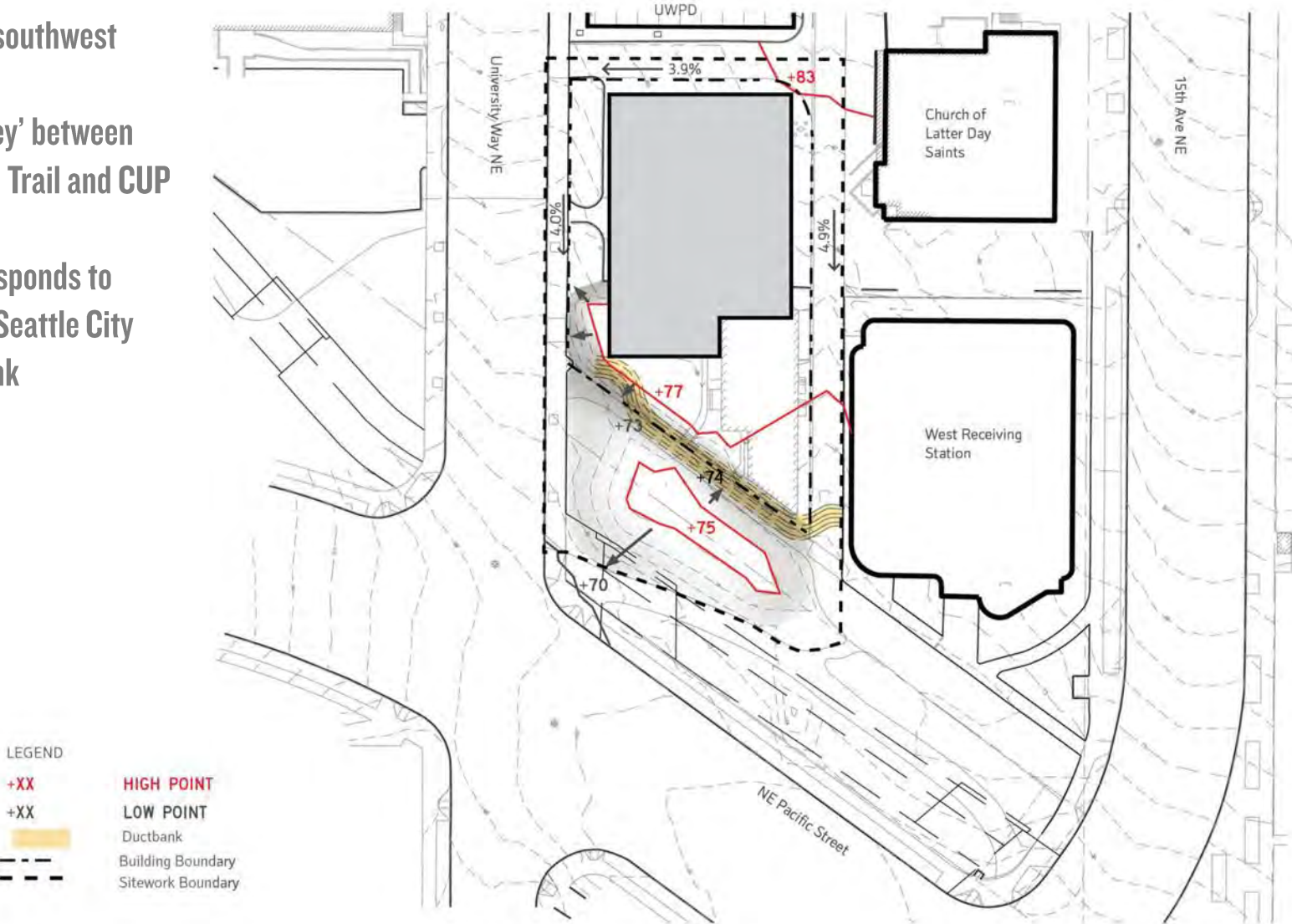


Edge of Screen
(14.5' from sidewalk)

Edge of Building Base

TOPOGRAPHY

- Low point at southwest corner
- Existing 'valley' between Burke Gilman Trail and CUP site
- 'Valley' corresponds to location of a Seattle City Light ductbank



SITE PLAN

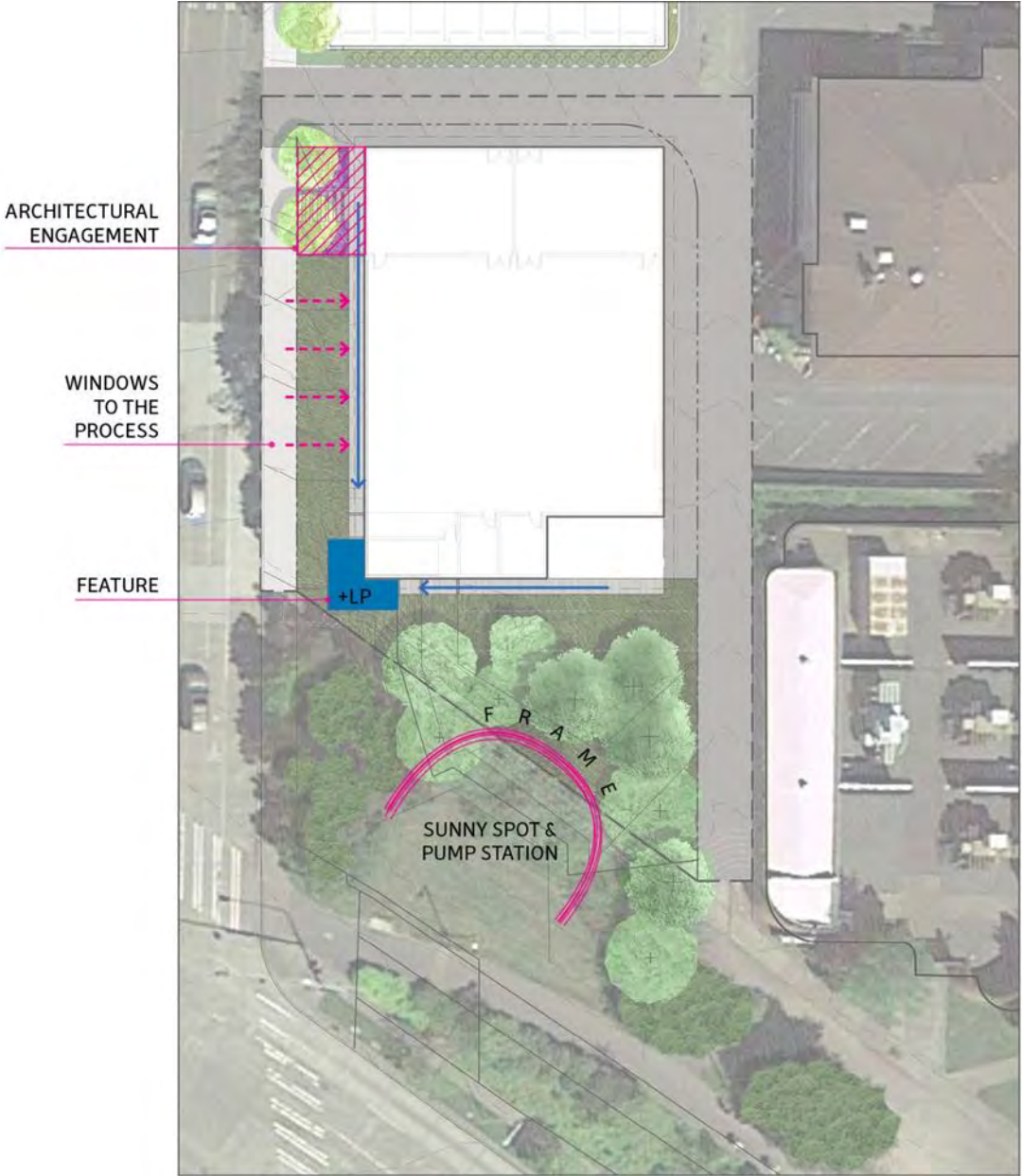


SITE PLAN - FUNCTIONAL ELEMENTS

- 2 @ 12' x 30' fuel tanks located on the south side of the building
- Existing electrical ductbank along southern property line
- Building access on the north and east building faces

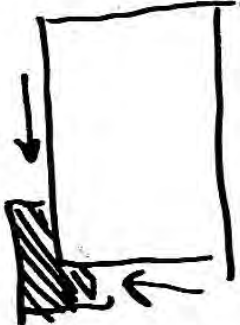
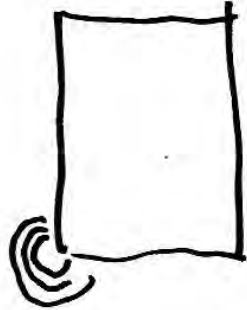
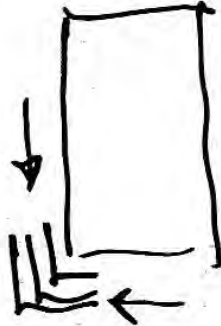
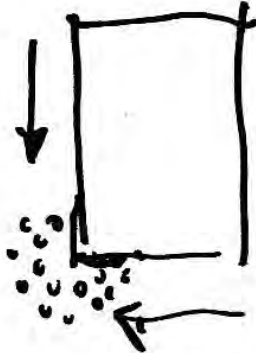
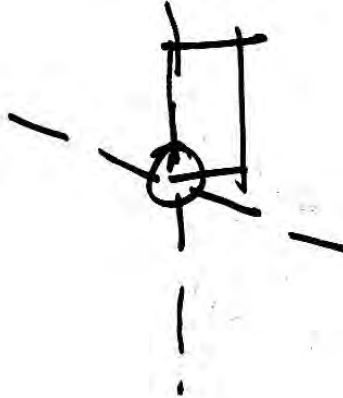


SITE PLAN



THE SOUTHWEST CORNER

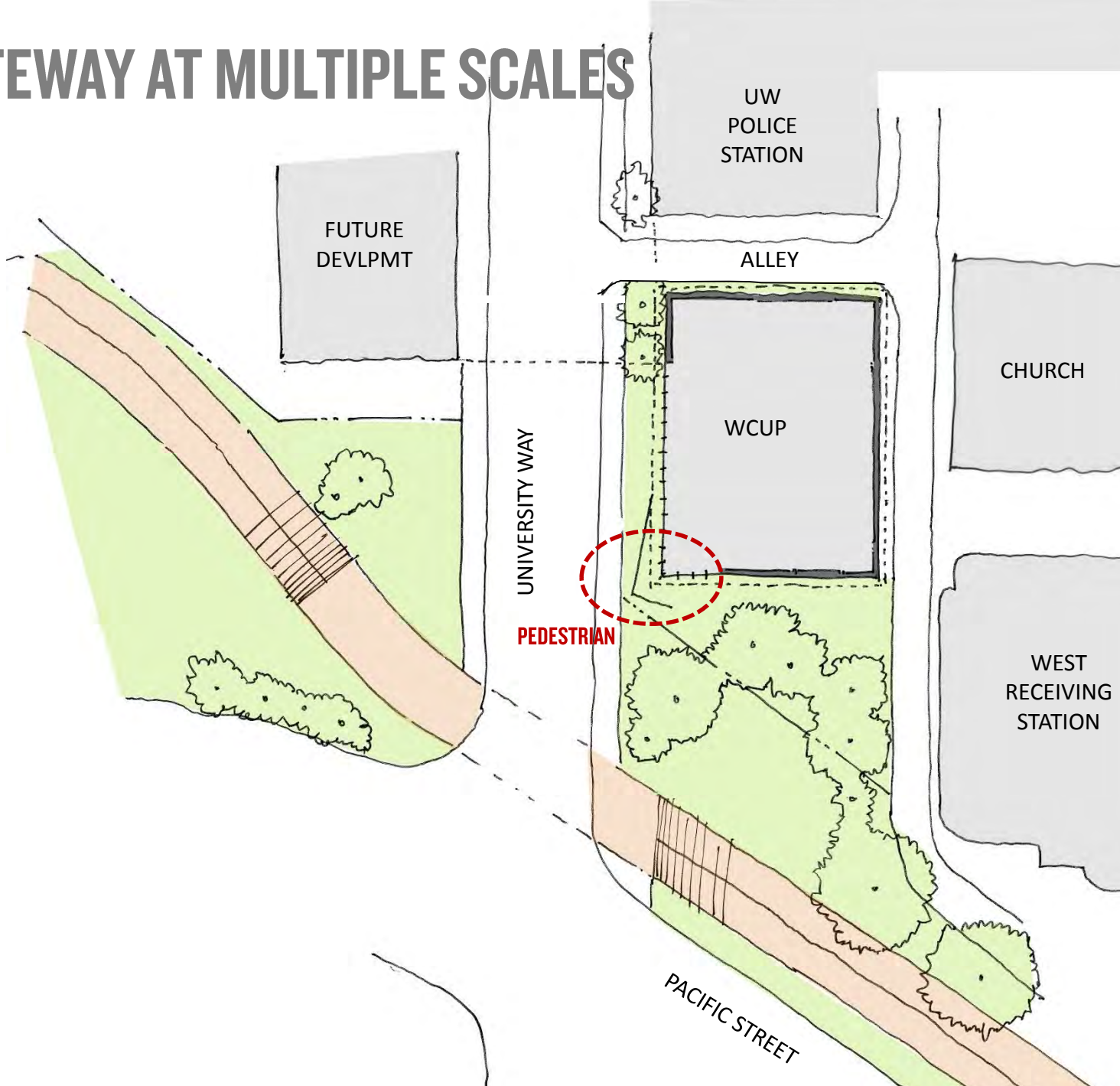
IMPORTANCE
OF THE
CORNER



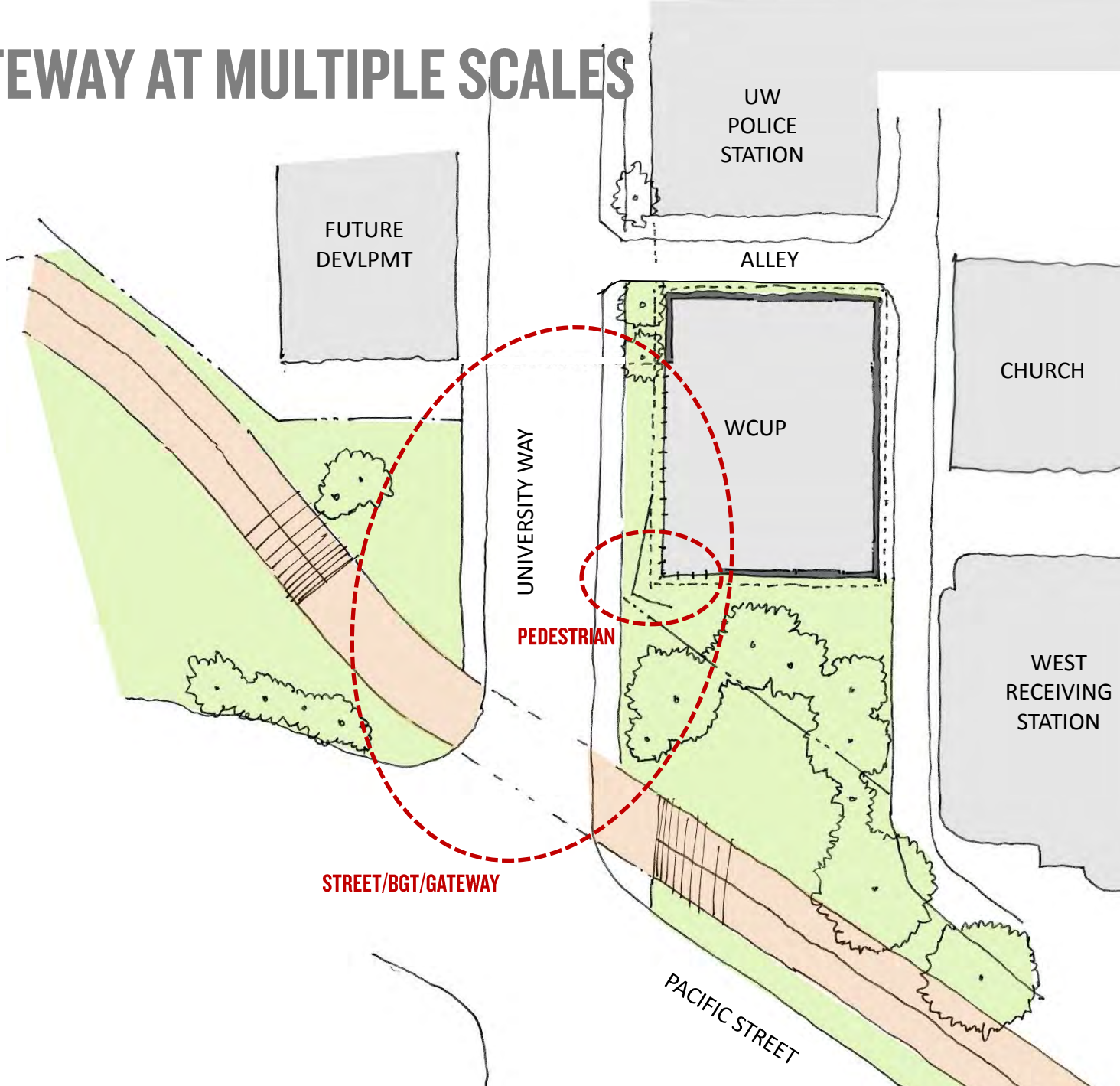
CAMPUS CONTEXT



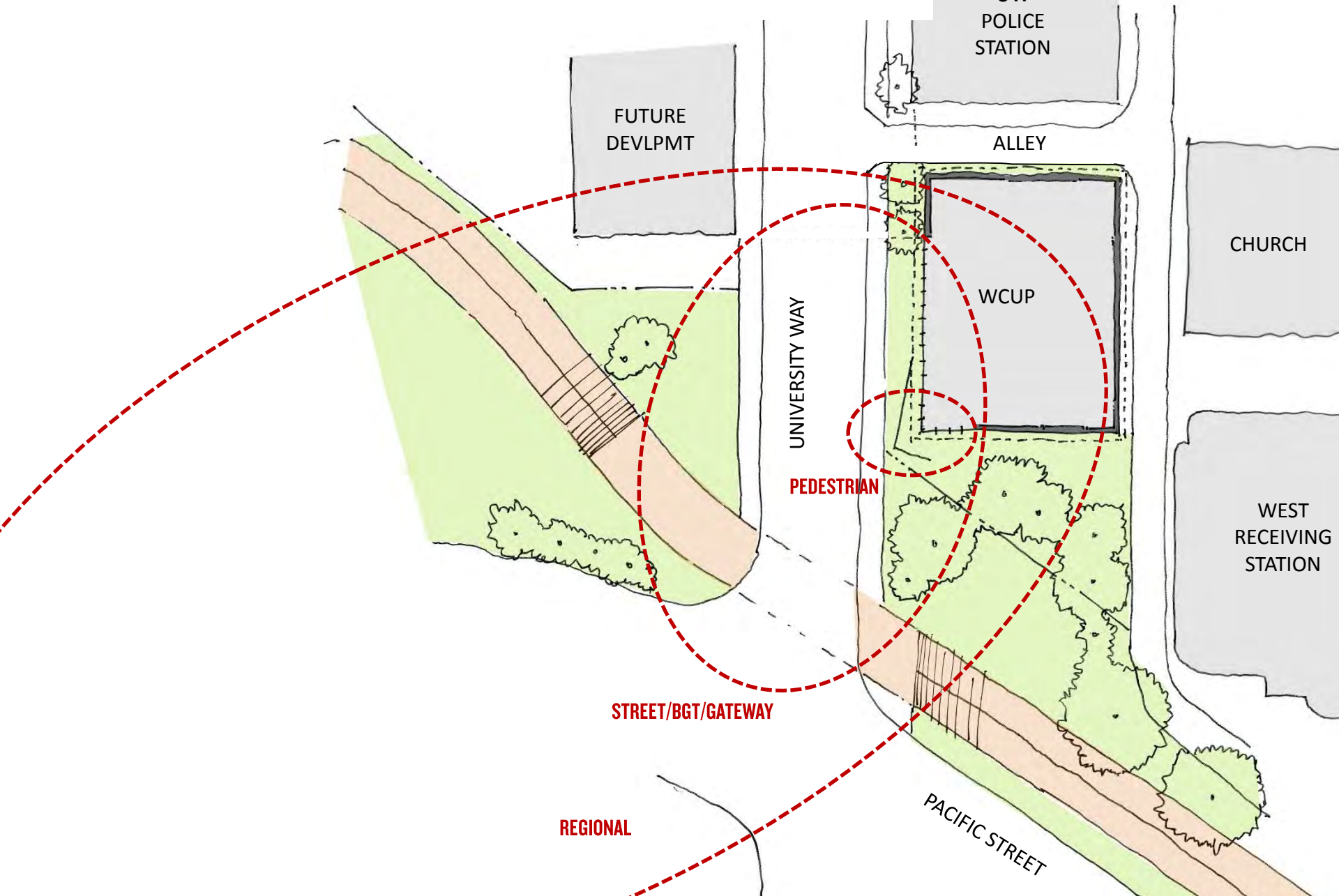
CAMPUS GATEWAY AT MULTIPLE SCALES



CAMPUS GATEWAY AT MULTIPLE SCALES



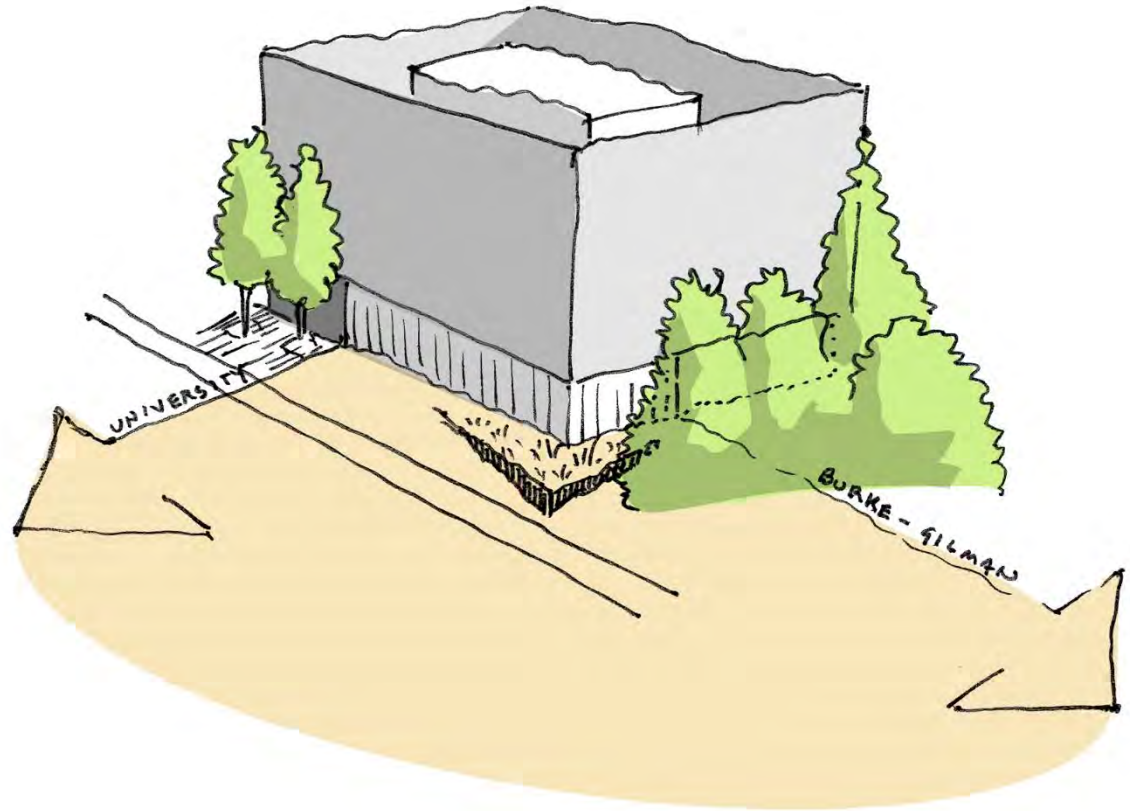
CAMPUS GATEWAY AT MULTIPLE SCALES



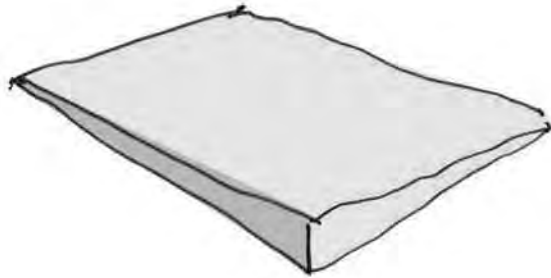
BUILDING ORIENTATION

IMPORTANT SOUTHWEST CORNER AT CAMPUS GATEWAY

- Views between WCUP and University and Burke Gilman Trail to west
- Views between WCUP and Burke Gilman Trail to south

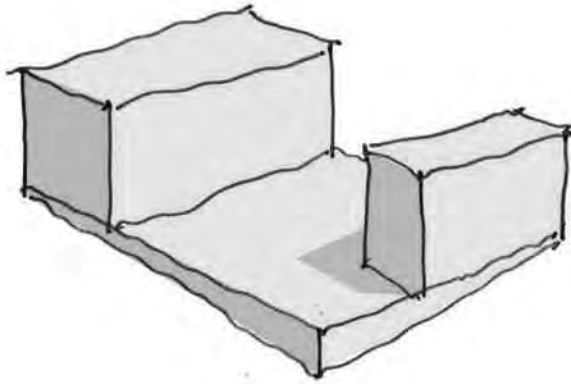


MASSING CONCEPT



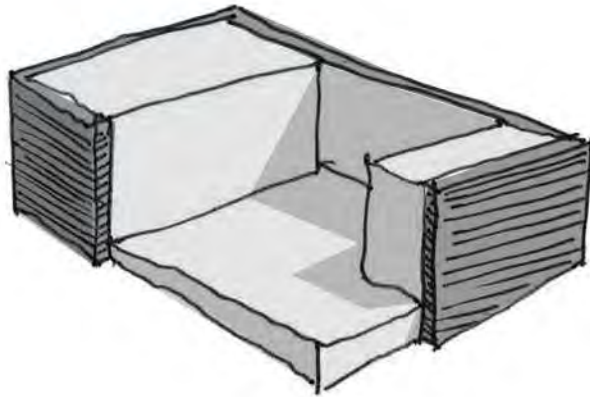
SLAB

MASSING CONCEPT



SOLIDS
SLAB

MASSING CONCEPT

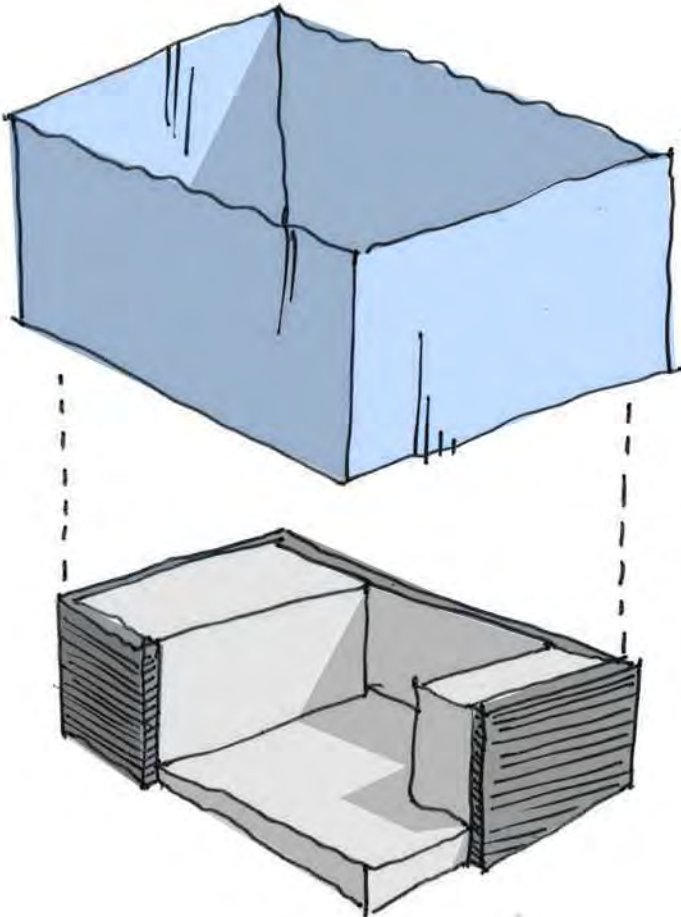


WRAPPER

SOLIDS

SLAB

MASSING CONCEPT



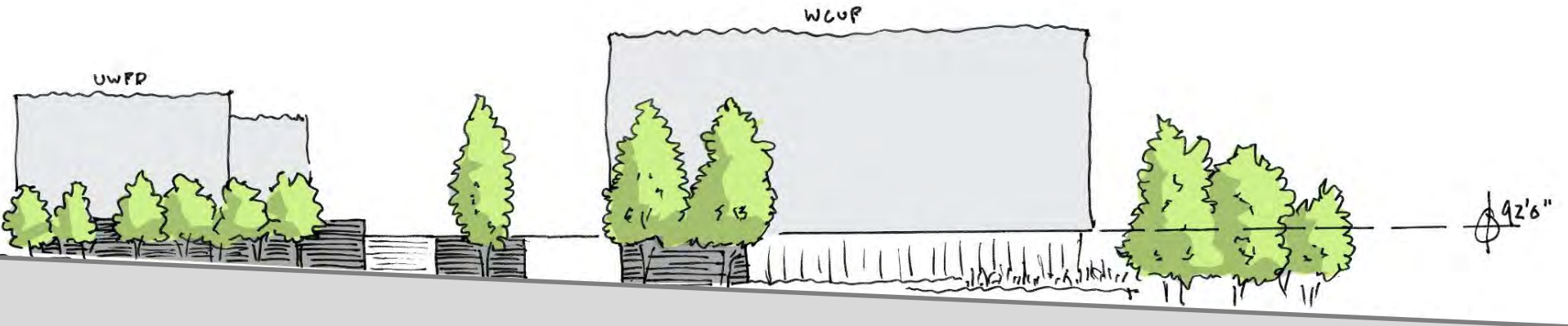
SCREEN

WRAPPER

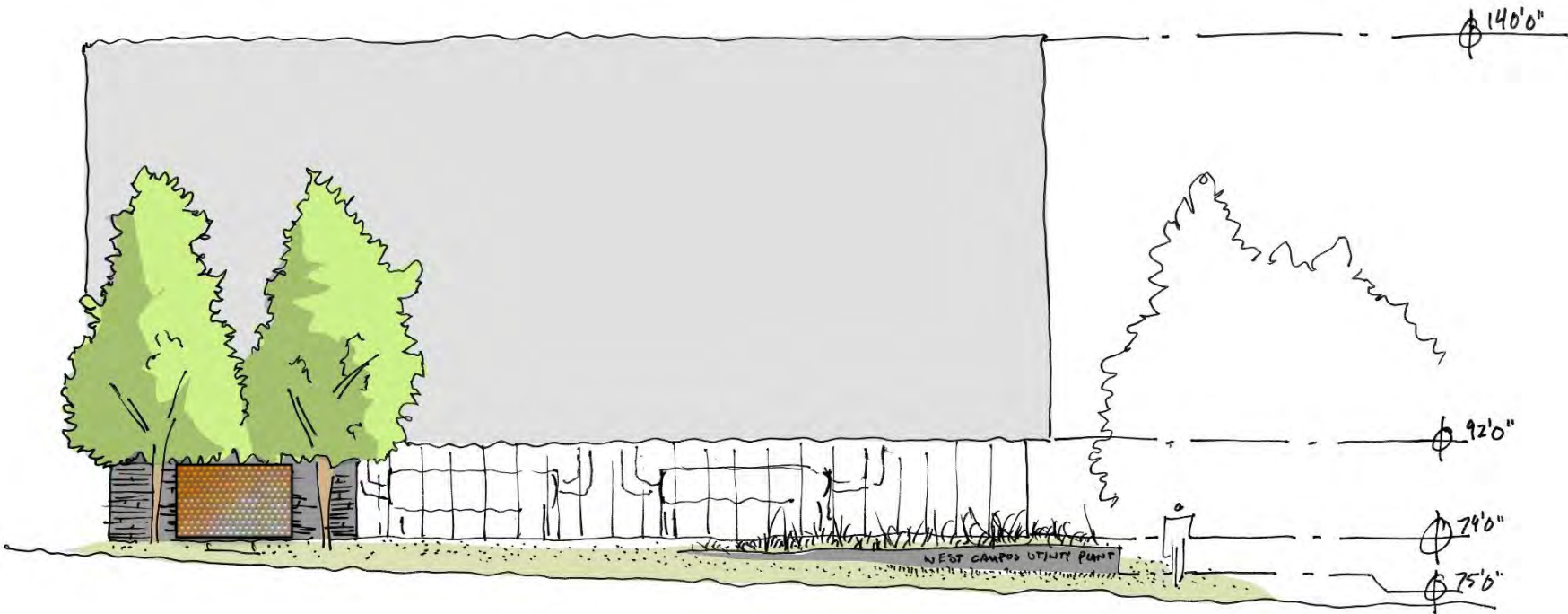
SOLIDS

SLAB

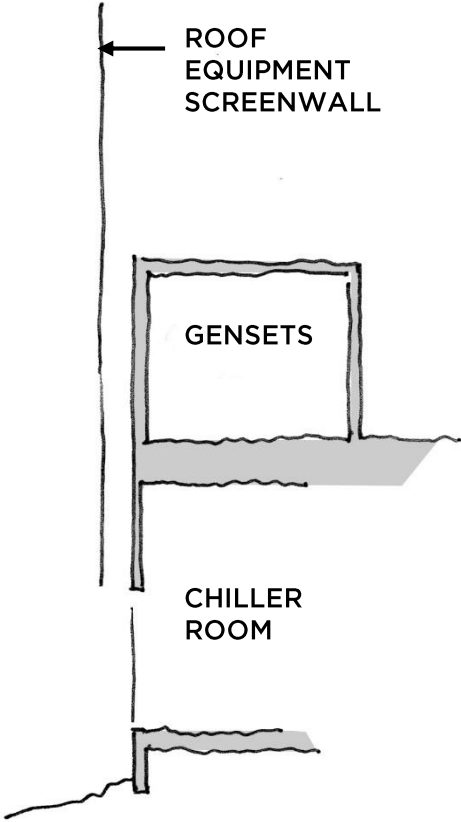
UNIVERSITY AVENUE DATUM



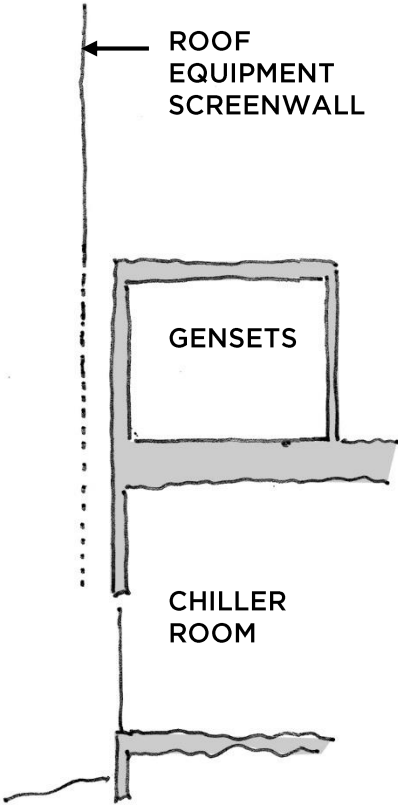
UNIVERSITY AVENUE ELEVATION



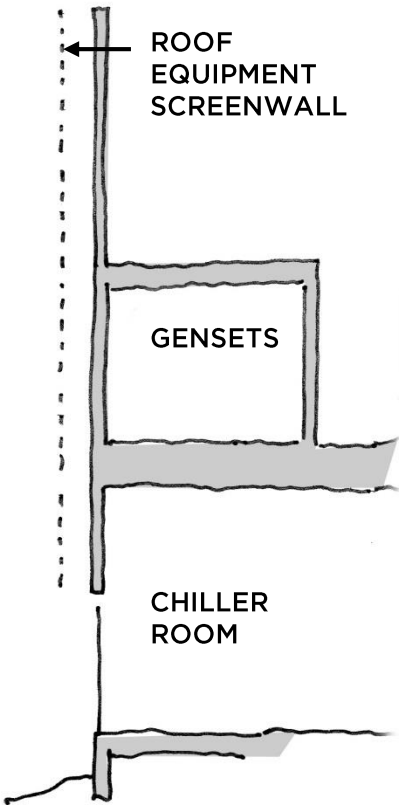
SCREEN POSSIBILITIES



SOLID



PERFORATED BELOW



**PERFORATED
WITH BACKUP WALL**

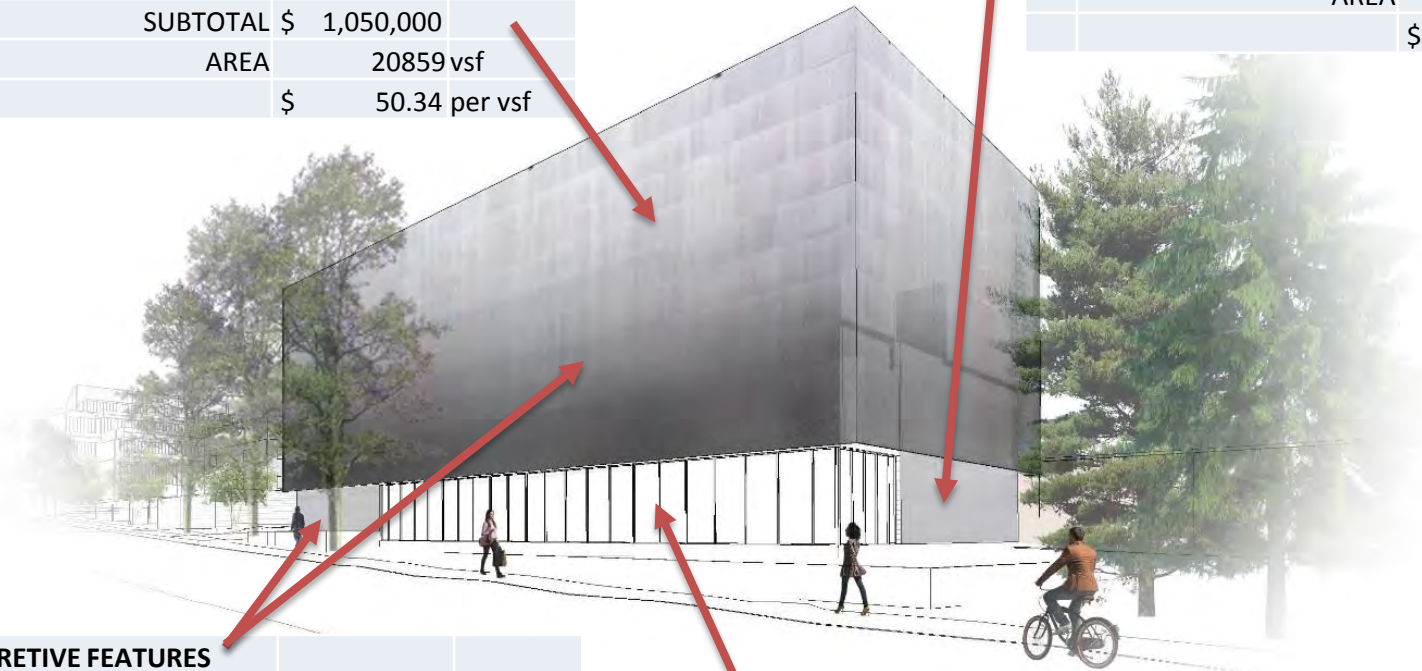
DESIGNING TO BUDGET

| SCREENWALL | | |
|-----------------------|-----------|----------------------|
| Structure | \$ | 260,000 |
| Screen Panels | \$ | 575,000 |
| Misc Finishes/Coping | \$ | 15,000 |
| Enhancement Allowance | \$ | 200,000 |
| SUBTOTAL | \$ | 1,050,000 |
| AREA | | 20859 vsf |
| | \$ | 50.34 per vsf |

| PRECAST INSULATED CONCRETE PANELS | | |
|-----------------------------------|-----------|----------------------|
| Precast Panels | \$ | 600,000 |
| Misc Support Steel | \$ | 32,000 |
| Paint at Interior | \$ | 7,000 |
| SUBTOTAL | \$ | 639,000 |
| AREA | | 9136 vsf |
| | \$ | 69.94 per vsf |

| INTERPRETIVE FEATURES | | |
|--------------------------|-----------|-----------------------|
| IT Backbone | \$ | 50,000 |
| LED Lighting / Dashboard | \$ | 138,000 |
| SUBTOTAL | \$ | 188,000 |
| AREA | | 1728 vsf |
| | \$ | 108.80 per vsf |

| STOREFRONT | | |
|-------------------|-----------|----------------------|
| Storefront System | \$ | 80,000 |
| SUBTOTAL | \$ | 80,000 |
| AREA | | 1250 vsf |
| | \$ | 64.00 per vsf |



SCREEN WALL STUDIES



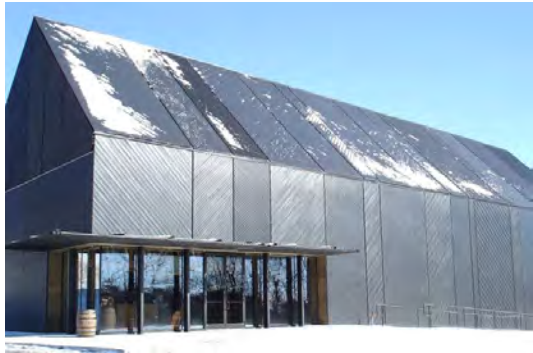
PROFILED



LOTT CLEAN WATER ALLIANCE - MILLER HULL



PATTERNED



WILD TURKEY VISITOR CENTER - DE LEON & PRIMER

TRANSLUCENT



LABAN DANCE CENTRE - HERZOG & DE MEURON
CENTRE FOR SYNCHROTRON SCIENCE - BATES SMART

SOLID AND TRANSLUCENT



ZLTO- DE ARCHITECKTEN CIE
TATE MODERN ADDITION- HERZOG & DE MEURON

PERFORATED



OSU EAST REGIONAL CHILLER PLANT - LEERS WEINZAPFEL
UW ALDER HALL - MAHLUM
DE YOUNG MUSEUM - HERZOG & DE MEURON



LAPPED



SOUTH TACOMA COMMUNITY CENTER - MILLER HULL
HOUSE K - THAM & VIDEGARD HANSSON

FACETED



TRESARCA RESIDENCE - ASSEMBLAGE STUDIO
DEAR GINZA BUILDING - AMANO DESIGN OFFICE

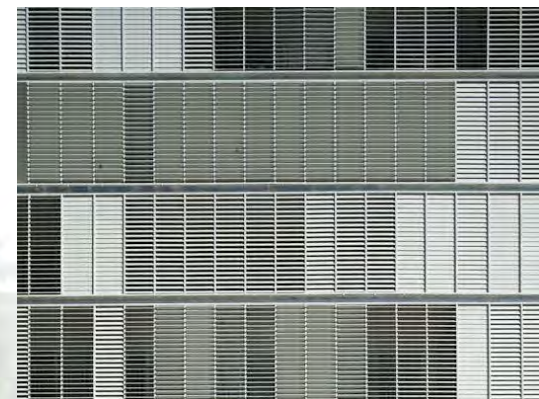


FOLDED



IPERA 25 - ALATAS ARCHITECTURE
PORTOBELLO ROAD CARPARK

LOUVERED

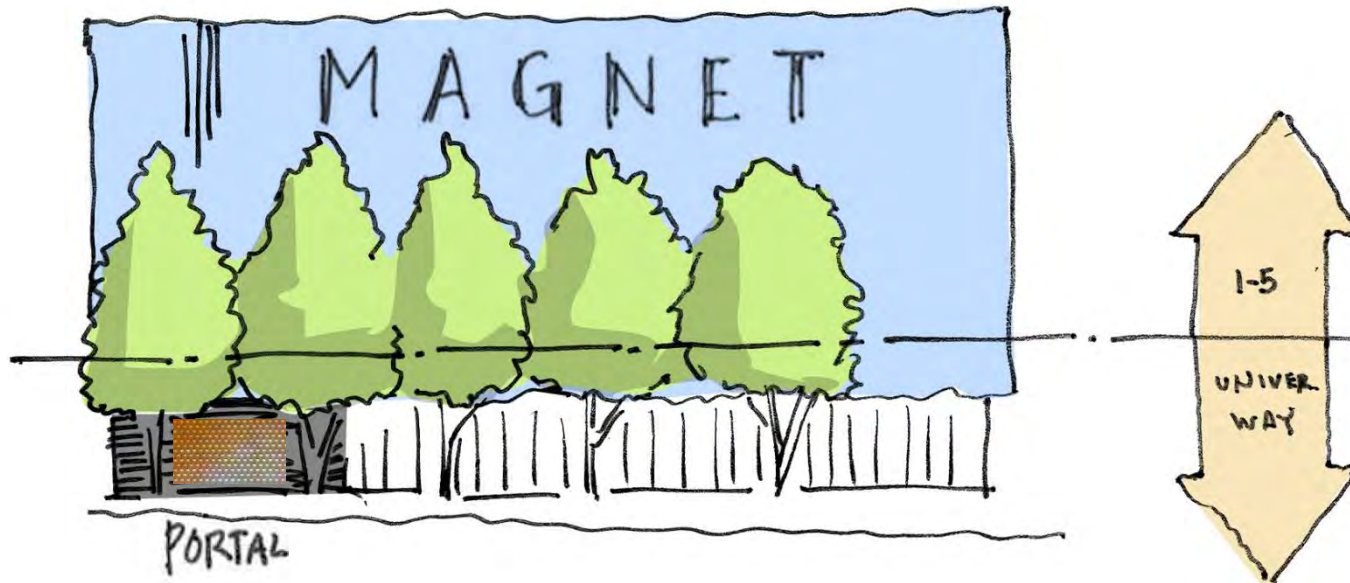


SWISS RAILWAY MAIN OFFICE - LUSSI + HALTER
MULTIFAMILY BUILDING - LOLA DOMENECH + ANTONIO MONTES
CASP 74 - BACH ARQUITECTES

BUILDING/INTERPRETIVE CONCEPT

MAGNET & PORTAL

- Facility to Attract Interest & Provide Opportunity for Engagement
- Interpretive Content to be Curated by UW ES&S
- Integrate Building Facades with Interpretive/Display at Multiple Scales
- Connect/Engage with BGT & University Way



INTERPRETIVE/DISPLAY OPPORTUNITIES

AUGMENTED REALITY

**3-D Virtual Objects are
Integrated into a 3-D Real
Environment in Real Time**

**Connections Can be Made to
Other UW Campus-wide
Information/Data/News:**

- **Sustainability Initiatives**
- **Campus Energy Usage**
- **UW Nobel Laureates**



PRIMARY SUBSTATION 2012 OLYMPICS - NORD ARCHITECTURE

INTERPRETIVE/DISPLAY OPPORTUNITIES

AUGMENTED REALITY

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Integrated into a 3-D Real
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PRIMARY SUBSTATION 2012 OLYMPICS - NORD ARCHITECTURE

OPEN DISCUSSION

FEEDBACK & GUIDANCE

OPEN DISCUSSION – FEEDBACK & GUIDANCE



SCREEN WALL STUDIES

