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?
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

WET SIDE

COOLING TOWERS

DRY SIDE

RADIATORS

WINDOW INTO THE PROCESS

CHILLERS

GENERATORS

PUMPS

TRANSFORMERS

65' MAXIMUM HEIGHT

+64' TOP OF SCREEN WALL

+28' ROOF

+4' GRADE

+15' BASEMENT

36' CLEAR

20' CLEAR

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
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

WCU 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 $12$ MW
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

+24' ROOF

-4' GRADE

-16' BASEMENT

65' MAXIMUM HEIGHT

39' CLEAR

20' CLEAR

14' CLEAR

WINDOW INTO THE PROCESS

PUMPS

CONNECTION TO DISTRIBUTION TUNNELS

COOLING TOWERS

GENERATORS

CHILLERS
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
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 - 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

ARCHITECTURAL ENGAGEMENT

WINDOWS TO THE PROCESS

FEATURE

+LP

SUNNY SPOT & PUMP STATION

FRAME
THE SOUTHWEST CORNER

IMPORTANCE OF THE CORNER
CAMPUS CONTEXT
CAMPUS GATEWAY AT MULTIPLE SCALES
CAMPUS GATEWAY AT MULTIPLE SCALES

- Alley
- University Way
- Church
- Future Devlpmt
- UW Police Station
- West Receiving Station
- WCUP
- Pedestrian
- Street/BGT/Gateway
- Pacific Street
- Regional
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
SCREEN POSSIBILITIES

1. SOLID
   - Roof equipment screenwall
   - Chiller room
   - Gensets

2. PERFORATED BELOW
   - Roof equipment screenwall
   - Chiller room
   - Gensets

3. PERFORATED WITH BACKUP WALL
   - Roof equipment screenwall
   - Chiller room
   - Gensets
# Designing to Budget

## Screenwall

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<tr>
<th>Component</th>
<th>Cost</th>
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<tr>
<td>Structure</td>
<td>$260,000</td>
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<tr>
<td>Screen Panels</td>
<td>$575,000</td>
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<tr>
<td>Misc Finishes/Coping</td>
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<tr>
<td>Enhancement Allowance</td>
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## Pre cast Insulated Concrete Panels

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<td>Misc Support Steel</td>
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## Interpretive Features

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## Storefront

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<td><strong>Cost per vsf</strong></td>
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SCREEN WALL STUDIES
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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PRIMARY SUBSTATION 2012 OLYMPICS - NORD ARCHITECTURE
OPEN DISCUSSION

FEEDBACK & GUIDANCE
SCREEN WALL STUDIES