



Flores Consulting Services, Inc. |

3847 Westside Ave. | Los Angeles | CA 90008 | P: 323 481-1645 | natof2014@gmail.com

Design and Construction – Non OSHPD Central Plant 4,000 tons of Chilled Water & 6 MW of Emergency Power & Distribution UCI Medical Center

- UCI Medical Center (UCIMC) in looking toward the future has developed a Long Range Development Plan to accommodate future growth. To efficiently absorb the planned growth, it has been determined that the infrastructure needs to be modernized. Part of this infrastructure upgrade includes expanding the existing central energy plant so that it can service all of the current and future OSHPD buildings at the medical center. FCSI managed for UCIMC, the development of the design build program to accomplish the expansion. Currently the Non OSHPD Buildings are all served in terms of cooling and emergency electrical by their own individual cooling and emergency generators
- The program will install a 4,000 ton chilled water plant with 4, 1,000 ton centrifugal chillers and 4, 2,000 KW emergency generators located in a central plant. The work includes consolidated all of the majority of its existing Non OSHPD buildings into the new central plant.
- The design build program for this plant was developed by FCSI.
- The program included not only the central plant but the distribution lines for chilled water, 12KV normal and emergency power as well as communication pathways and medical oxygen to it's Non OSHPD buildings that were not serviced by the existing central plant.
- The program was developed as a concept by GHD Engineering under the management of FCSI. The design build firms participating in the competition were given the latitude to alter the concept as long the intent and performance goals are met.
- The overall budget for the project is \$25,590,000 and the schedule is 18 months.

UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER NON-OSHPD CHILLER PLANT & CENTRAL POWER PLANT

GENERAL NOTES

1. ALL IMPROVEMENTS SHOWN, INCLUDING ELEVATIONS, SHALL BE CONFIRMED BY FIELD MEASUREMENTS PRIOR TO CONSTRUCTION.
2. IF THERE IS ANY QUESTION REGARDING THESE PLANS OR FIELD STAKES, THE CONTRACTOR SHALL REQUEST AN INTERPRETATION BEFORE DOING ANY WORK BY CALLING THE PROJECT RESIDENT ENGINEER AT UCI MEDICAL CENTER.
3. LOCATIONS OF ALL EXISTING IMPROVEMENTS AND UTILITIES ARE APPROXIMATE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS AND VERIFY ALL CONDITIONS ON THE JOB SITE.

UNDERGROUND UTILITIES

AT LEAST TWO (2) WORKING DAYS PRIOR TO EXCAVATION, THE CONTRACTOR SHALL REQUEST A MARK-OUT OF UNDERGROUND UTILITIES BY CALLING THE BELOW LISTED REGIONAL NOTIFICATION CENTER FOR AN INQUIRY (IDENTIFICATION NUMBER:

UNDERGROUND SERVICE ALERT (J.S.A.) 811

CONTRACTOR'S RESPONSIBILITIES

CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

WATER POLLUTION CONTROL NOTES:

THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS NOTED IN THE GREENBOOK - WATER POLLUTION CONTROL. PREPARE A WATER POLLUTION CONTROL PLAN (WPCL) AND PROTECT ALL EXISTING STORM DRAIN INLET STRUCTURES FROM SEDIMENTATION. CONTAMINATION FROM RUNOFF, ROCK WASHING RUNOFF, OR ANY OTHER PROJECT SITE RUNOFF BY PLACING EROSION CONTROL DEVICES AS APPROVED BY THE PROJECT RESIDENT ENGINEER AT UC MEDICAL CENTER.

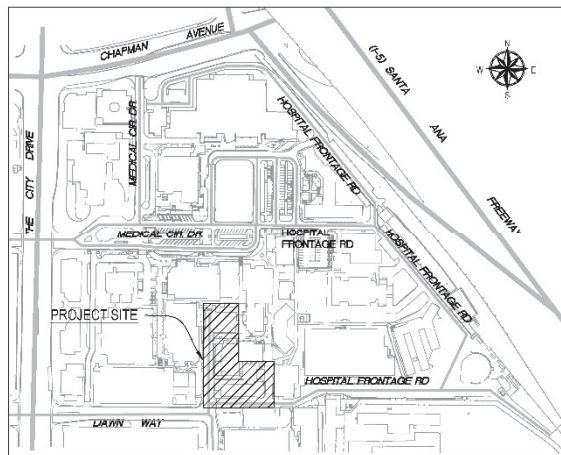
BENCHMARK

ORANGE COUNTY PUBLIC WORKS
ORANGE COUNTY SURVEY DESIGNATION: SA-341-09
DESCRIBED BY OCS 2009-FOUND 4" OCS ALUMINUM BENCH-MARK DISK STAMPED "SA-341-09"
SET IN THE NORTHWESTERLY CORNER OF A 4 FT. BY 12 FT. CONCRETE CATCH BASIN MONUMENT. IS LOCATED IN THE NORTHWESTERLY CORNER OF THE INTERSECTION OF CHAPMAN AVENUE AND STATE COLLEGE/THE CITY DR. 69 FT. WESTERLY OF THE CENTERLINE OF CHAPMAN AVE. MONUMENT IS SET LEVEL WITH "THE SIDEWALK.

ELEVATION - 1985 FT. ANAHEIM

BASIS OF BEARINGS

"THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM (ZONE 18) SHOWN LOCALLY ON CONTROL STATIONS' CURF AND TRIM. HAD (BACKGROUND) AS SHOWN. HORIZONTAL BEARINGS SHOWN ON THIS MAP ARE GRID, QUOTED BEARINGS AND DISTANCES FROM REFERENCE MARKS OR LEGEND ARE ALL SHOWN PER 7-607 RECORD REFERENCE. ALL DISTANCES SHOWN ARE GRID DISTANCES UNLESS SPECIFIED OTHERWISE. GRID DISTANCES MAY BE OBTAINED BY MULTIPLYING THE GROUND DISTANCE BY A CONVERSION FACTOR OF 1.0000047. CALCULATIONS ARE MADE AT PT. 1 WITH COORDINATES OF N 202217.00 E 462988.76 USAD AN ELEVATION OF 132.43 CONVERGENCE ANGLE AT PT. 01 - 47'54"37"



VICINITY MAP

EXISTING STRUCTURES

- WATER VALVE
- WATER METER
- FIRE UNDERMINT
- SEWER MANHOLE
- STORM DRAIN INLET
- GAS VALVE
- STREET LIGHT
- STREET SIGN
- ELECTR. POLE
- TELE. PESTAL
- ELECTR. C. VALTY. TRANSFORMER

N.T.S.

- SEWER
- WATER
- ELECTRIC
- COMBINATION
- GAS
- STORM DRAIN
- FIRE WATER

DRAWING LIST

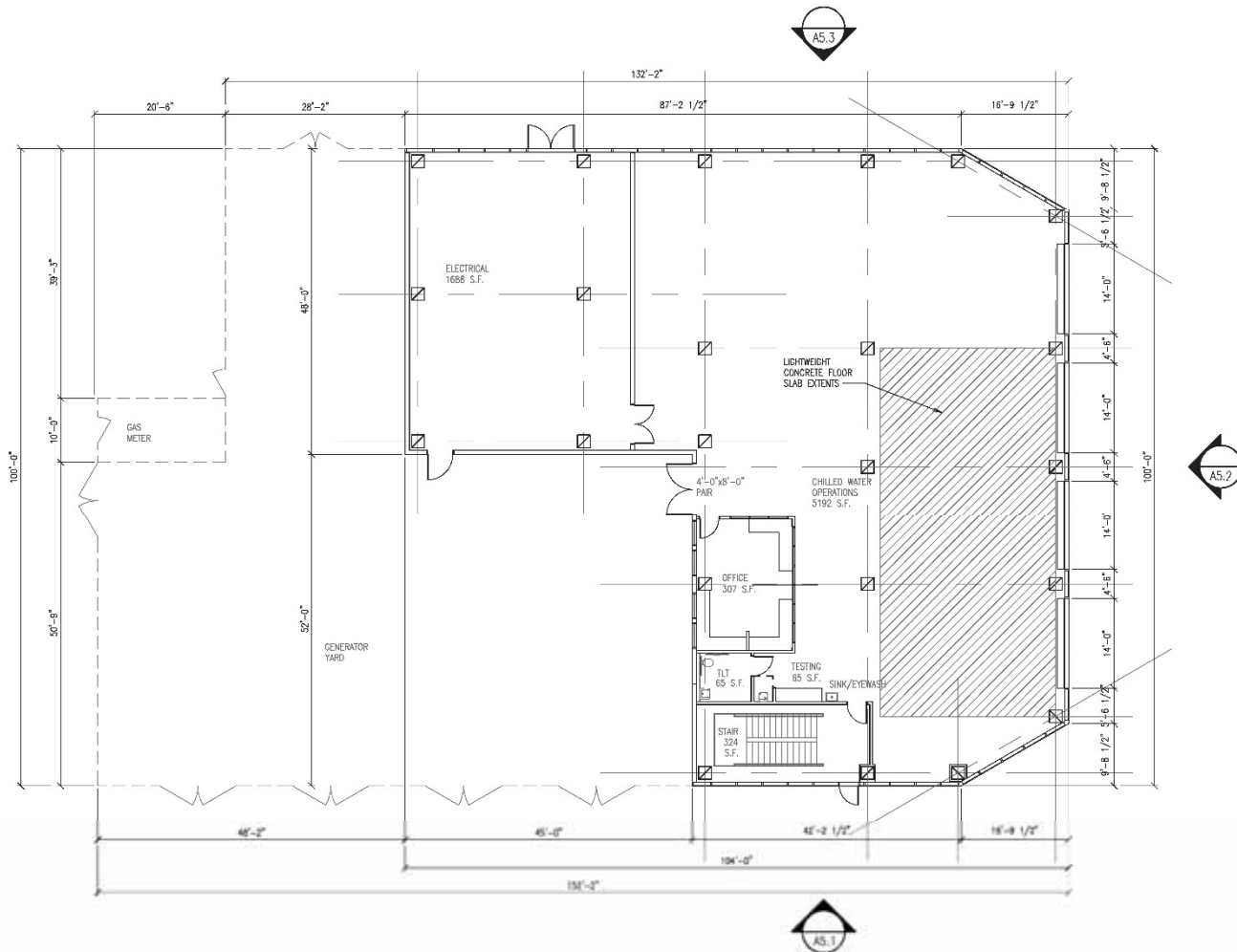
DRG No.	DRAWING TITLE
1-0	TITLE SHEET
0-1-C	DEFINITION PLAN
0-2-C	UTILITY RELOCATION AND CONSTRUCTION PLAN
0-3-C	SITE IMPROVEMENT PLAN
0-4-C	UTILITIES PLAN
1-1-C	MECHANICAL
1-1-1	FLOOR PLAN
1-1-2	ROOF PLAN
1-1-3	ELEVATION PLAN
1-1-4	ELEVATION PLAN
1-1-5	ELEVATION PLAN
1-1-6	ELEVATION PLAN
1-1-7	ELEVATION PLAN
1-1-8	Mechanical H. 107-1-1-8
1-2-0	Mechanical ROOF PLAN
1-1-0	NORMAL AND EMERGENCY ELECTRICAL SITE PLAN
1-1-1	NORMAL AND EMERGENCY ELECTRICAL SITE PLAN
1-2-0	NORMAL AND EMERGENCY 2-W. SINGLE-LINE DIAGRAM

ABBREVIATIONS

AC	ASPHALT CONCRETE	N	NORTH
AP	ANGLE POINT	NAT	NATIVE
BC	BEGIN CURVE	NTS	NOT TO SCALE
BOR	BEGIN CURB RETURN	PG	PROFILE GRADE
BEG	BEGIN	PKWY	PARKWAY
CATV	CABLE TV	PROP	PROPOSED
CB	CURB	PC	POINT OF COMPOUND CURVE
C	CENTERLINE	PRC	POINT OF REVERSE CURVE
CTB	CEMENT TREATED BASE	RC	RELATIVE COMPACTION
CI	CURB INLET	RT	RIGHT
CONC	CONCRETE	ROW/RW	RIGHT OF WAY
CR	CURB RETURN	SHT	SHEET
CRWY	DRIVEWAY	SDWK	SIDEWALK
DS-X	DRAINAGE SYSTEM-X	SS	STAINLESS STEEL
CWT	DETECTABLE WARNING TRIES	SP	SIDEWALK
DR	DRIVEWAY	SWR	SEWER
EW	EASE	S	SCUM
E	EXIST'G	TC	TOP OF CURB
EL. ELEV	ELEVATION	TEL	TELEPHONE
ELEC	ELECTRIC	TRP	TRIP
ETP	EASE TRAVEL WAY	WRF	WALKWAY
EX	EXISTING	VERT	VERTICAL
FF	FRESH FLOOR	W	WEST
FS	FRESH SURFACE		
HP	HIGH POINT		
L	LENGTH		
LT	LEFT		

CONCEPTUAL PLANS

			<table border="1" style="width: 100%;"> <tr> <td>Client: UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER</td> <td>Project: NON-OSHPD CHILLER PLANT & CENTRAL POWER PLANT</td> </tr> <tr> <td>Drawn: [Name]</td> <td>Checked: [Name]</td> </tr> <tr> <td>Scale: AS SHOWN</td> <td>Arch D Drawing No: T-1-0</td> </tr> </table>	Client: UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER	Project: NON-OSHPD CHILLER PLANT & CENTRAL POWER PLANT	Drawn: [Name]	Checked: [Name]	Scale: AS SHOWN	Arch D Drawing No: T-1-0
Client: UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER	Project: NON-OSHPD CHILLER PLANT & CENTRAL POWER PLANT								
Drawn: [Name]	Checked: [Name]								
Scale: AS SHOWN	Arch D Drawing No: T-1-0								
<p>UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER NON-OSHPD CHILLER PLANT & CENTRAL POWER PLANT TITLE SHEET</p>									



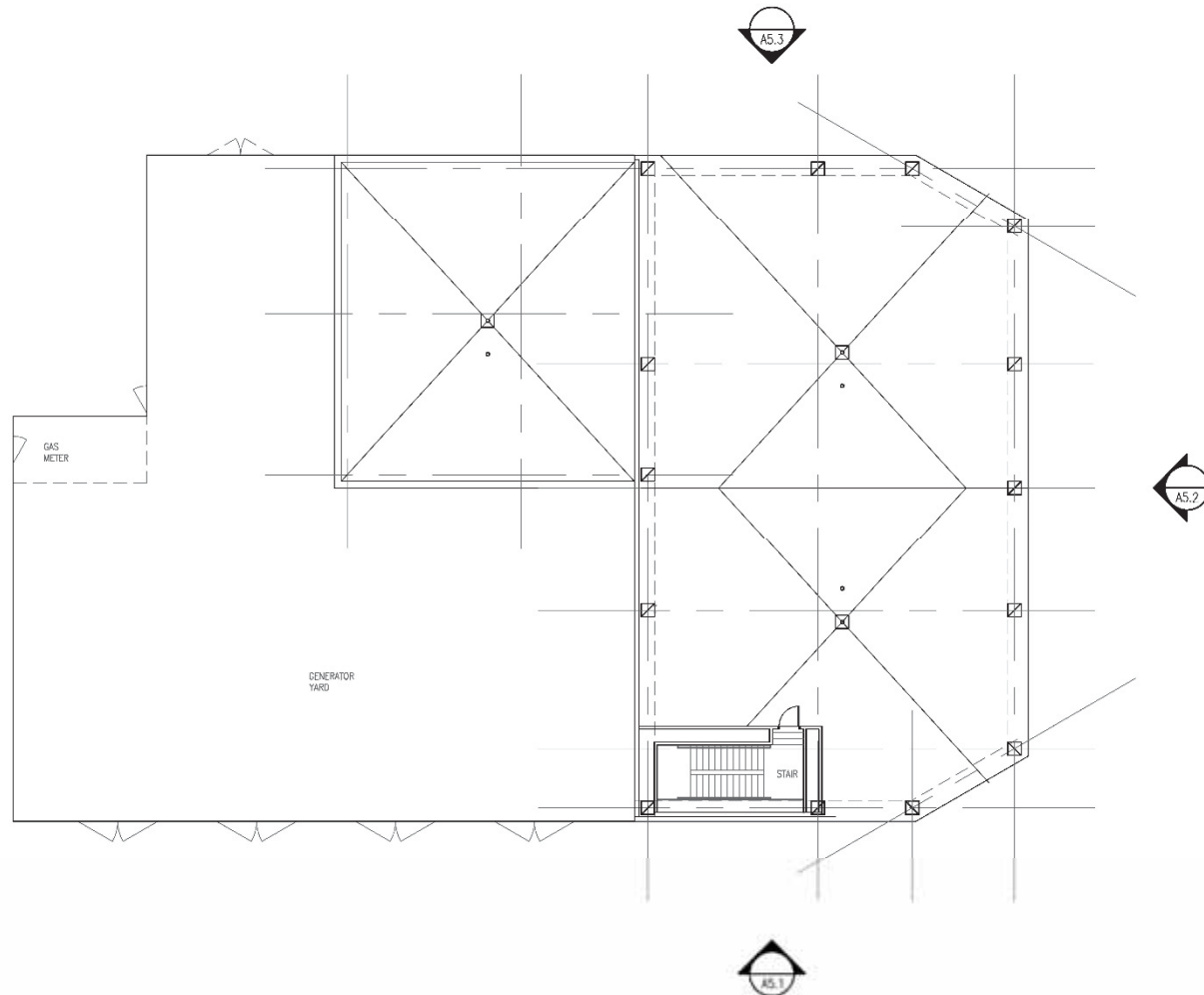
NO.	DATE	DESCRIPTION	BY	CHECKED



Client:	UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER
Project:	NON-ORSPD CHILLER PLANT AND CENTRAL POWER PLANT
Phase:	FLOOR PLAN
Architect:	DAVIS STORES CLAMPBRET ARCHITECTS
Date:	
Scale:	AS SHOWN

UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER
NON-ORSPD CHILLER PLANT AND CENTRAL POWER PLANT
FLOOR PLAN

Arch D Drawing No: A1-1

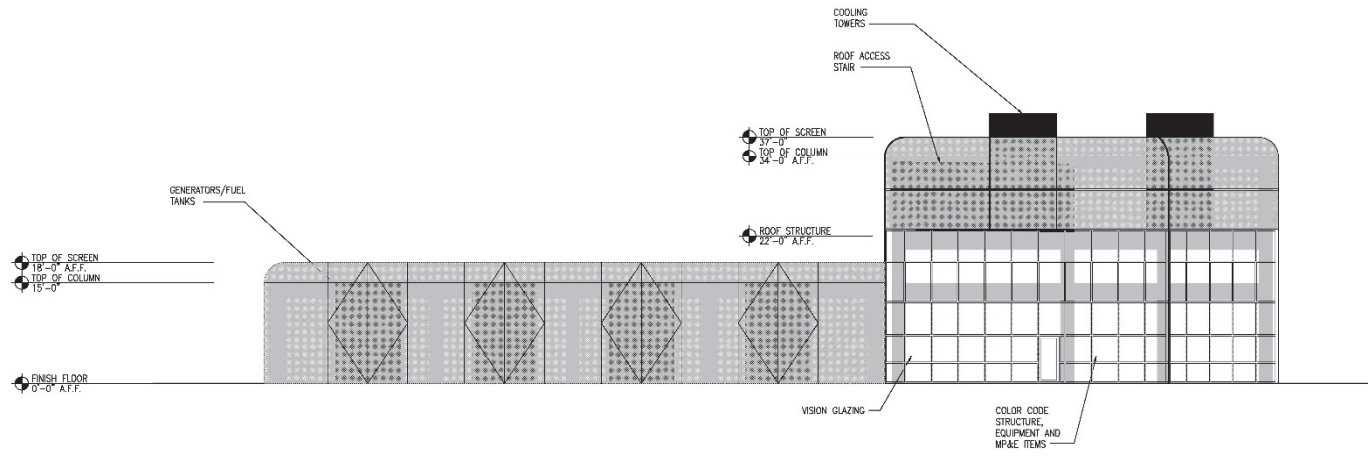




Client:	Designer:
Contract:	Design:
Approved:	Project Manager:
Date:	
Scale:	

UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER
NON-CHSPD CHILLER PLANT AND CENTRAL POWER PLANT
ROOF PLAN
 Date: 08/20/2018
 Author: Arsh D Drawing No: A4-1

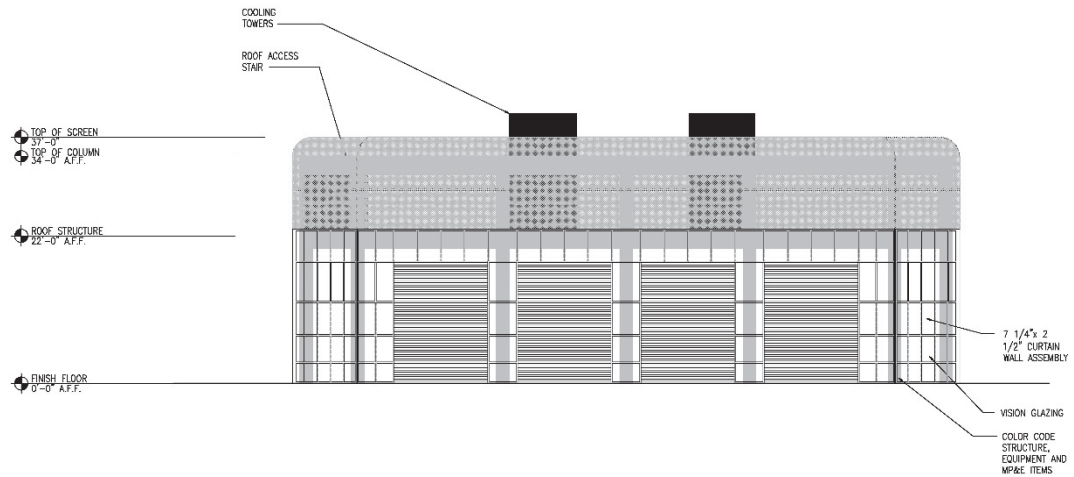
1. All drawings are the property of Davis Stores Collaborative Architects. No part of this drawing may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Davis Stores Collaborative Architects.



SOUTH ELEVATION



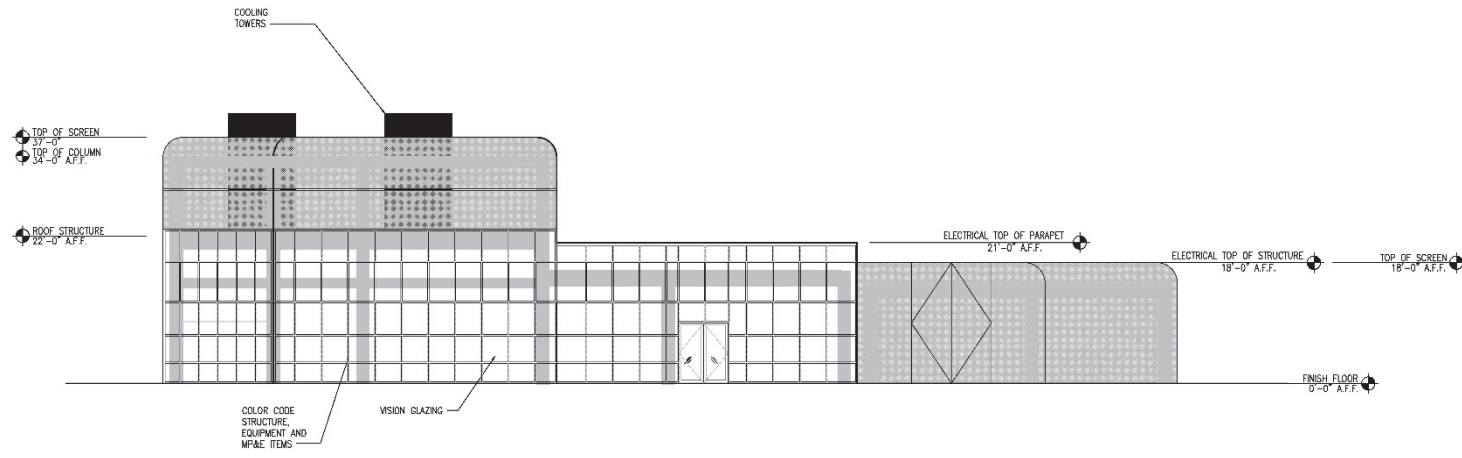
				Client: UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER Project: NON-OHSPD CHILLER PLANT AND CENTRAL POWER PLANT Title: ELEVATION PLAN	
Date: 10/14/16 Drawn by: [Name] Checked by: [Name]		Date: 10/14/16 Drawn by: [Name] Checked by: [Name]		Arch C Drawing No: AS-1	



EAST ELEVATION



				Project: UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER Non-CHSPD Chiller Plant and Central Power Plant Elevation Plan Date: 08/20/2018 Drawing No: AS-2
UC Irvine Health		DAVIS STORES COLLABORATIVE ARCHITECTS		Project: UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER Non-CHSPD Chiller Plant and Central Power Plant Elevation Plan Date: 08/20/2018 Drawing No: AS-2



NORTH ELEVATION



				Client: UNIVERSITY OF CALIFORNIA IRVINE MEDICAL CENTER Project: NON-CHSPD CHILLER PLANT AND CENTRAL POWER PLANT Title: ELEVATION PLAN
Designer: [Blank] Checker: [Blank] Approver: [Blank] Date: [Blank]		Designer: [Blank] Checker: [Blank]		Drawing No: AS-3 Date: [Blank]

UC Irvine Health | Davis Stores Collaborative | University of California Irvine Medical Center | Non-CHSPD Chiller Plant and Central Power Plant | Elevation Plan | AS-3 | 2/14/2025

Table of contents

1.	Introduction	1
2.	Project Narratives	2
	Division 00 – Procurement and Contracting Requirements	2
	Division 1 – General Requirements	2
	Division 2 – Existing Conditions	5
	Division 3 – Concrete	5
	Division 4 – Masonry	5
	Division 5 – Metals	6
	Division 6 – Rough Carpentry	6
	Division 7 – Thermal and Moisture Protection	8
	Division 8 – Openings	17
	Division 9 – Finishes	29
	Division 22 – Plumbing	29
	Division 23 – Heating, Ventilating, and Air Conditioning (HVAC)	30
	Division 26 – Electrical	37
	Division 31 – Earthwork	44
	Division 32 – Exterior Improvements	46
	Division 33 – Utilities	50

Appendices

Appendix A – Conceptual Plans

1. Introduction

As part of the overall campus master plan, UCIMC plans to consolidate utilities for all Non-OSHDP buildings to be served from a new central chilled water plant. The new Chiller Plant and Emergency Power Plant will be located just west of the existing Steam Plant Building 31 and provide services to the entire medical center with the exception to Douglas Hospital Building 1, Buildings 1A and 3, Building 31, Building 57, and the future emergency Department expansion.

The new Chiller Plant and Central Power Plant (central emergency generator and essential power distribution system) shall be constructed with capacity to serve all of the OSHDP-3 and non-OSHDP facilities.

The plant will be designed to accommodate four (4), water cooled, 1,000 ton chillers and two (2), 2,000 cooling towers.

Initially the chiller plant will house one (1) 1,000 ton chiller, one (1) 2,000 ton cooling tower to serve buildings 22C, 23, 54 and 55. However, the plant will be designed and constructed to easily allow the addition of three (3) additional chillers as the future load demands dictate. The design and construction of the plant must be executed in such a way that the additional chillers, cooling tower and auxiliary equipment can be installed in place without major modifications or disruptions to the overall system(s).

The design build team shall incorporate provisions to provide compliance for building #20 and the Chiller Plant with respect to fire separation distance (Table 705.8 CBC) from a property line. This may include upgraded protection of building #20 openings and/or exterior wall, a separation wall or both.

2. Project Narratives

2.1 Division 00 – Procurement and Contracting Requirements

2.1.1 00 30 00 Available Information

The program envisions a new approximately 8,000 sf building which will house mechanical and electrical systems, a control office and toilet facilities for staff. The structure height will be as determined by the equipment housed within and is expected to have a bearing height of approximately 22' and a rooftop screen to be an additional 15-20' in height (2/3 the height of the cooling towers) to screen the cooling towers, which will be mounted on the roof. An equipment screen will be constructed for a generator yard to be roughly 6,278 sf in size. The screen fence will be 10'-15' high (must cover the generators) and constructed to metal screen materials.

2.2 Division 1 – General Requirements

2.2.1 01 00 00 General Requirements

- 2013 California Code of Regulations (CCR) Title 24:
- Part 1 - California Building Standards Administrative Code
- Part 2 - California Building Code
- Part 3 - California Electrical Code
- Part 4 - California Mechanical Code
- Part 5 - California Plumbing Code
- Part 6 - California Energy Code
- Part 9 - California Fire Code
- Part 11 - California Green Building Standards Code
- California Energy Commission, Title 24, 2007 (AB970)
- National Fire Protection Association
 - NFPA 70, National Electric Code
 - NFPA 72, National Fire Alarm Code
 - NFPA 90A: Standard for the Installation of Air-Conditioning and Ventilating Systems
 - NFPA 101, Life Safety Code
- California Code of Regulations, Division of Industrial Safety Regulations, Title 8
- Title 24 California State Accessibility Standards, State Architectural Regulations for Accommodation of the Physically Handicapped in Public Facilities
- Underwriters Laboratories, Inc.
- American National Standards Institute
- ANSI/NECA Installation Standards and NETA Testing Standards
- HVAC design shall comply with requirement of ANSI and ASME.

This document is in draft form. The contents, including any opinions, conclusions or recommendations contained in, or which may be implied from, this draft document must not be relied upon. GHD reserves the right, at any time, without notice, to modify or retract any part or all of the draft document. To the maximum extent permitted by law, GHD disclaims any responsibility or liability arising from or in connection with this draft document.

- ASHRAE Standard 62
- ASHRAE Standard 90.1
- ASHRAE Handbooks
- International Building Code, 2012 Edition (IBC 2012)
- American Society of Civil Engineers, "Minimum Design Loads for Buildings and Other Structures," 2010 Edition (ASCE 7-10)
- American Institute of Steel Construction, "Steel Construction Manual," 14th Edition (AISC 14)
- American Concrete Institute, "Building Code Requirements for Structural Concrete," 2014 Edition (ACI 318-14)
- American Concrete Institute, Building Code Requirements for Structural Concrete and Commentary (ACI 318-11)
- The Masonry Society, Building Code Requirements and Specification for Masonry Structures (TMS 402-11/ACI 530-11/ASCE 5-11)
- American Institute of Steel Construction, Manual of Steel Construction, Allowable Stress Design (AISC-ASD), 9th Edition
- American Institute of Steel Construction, Manual of Steel Construction, Load and Resistance Factor Design (AISC-LRFD), 14th Edition
- American Welding Society (AWS), Structural Welding Code, D1.1-10, with amendments to date

2.2.2 01 10 00 Summary

- The design concept includes curtain wall assemblies infilling or covering a steel braced frame structure. The façade includes butt glazed curtain wall with vision glass in order to visualize color coded equipment and structure within. Cooling tower screening is to be achieved with a metal screen system which is in the same plane as the curtain wall for seamless integration into the design. The central power plant yard screen shall be designed to match the rooftop screen.
- The plant needs to be a sustainability plant and strive to achieve **LEED Silver**.
- All structures shall be designed based on sound engineering judgment, proper application of structural theory, and in conformance with all applicable code requirements. The structural design shall be performed using the following design criteria and materials of construction.
- The chiller plant shall be constructed almost entirely out of structural steel with concrete filled metal decking. Exceptions to this include the building foundations comprised of cast-in-place concrete; and a reinforced masonry wall to separate the Chiller Plant from the Central Power Plant. The steel frame shall support the perimeter glass and metal mesh curtain wall system.
- The gravity load resisting system of the Chiller Plant shall consist of either open web steel joists or wide flange beams spanning to wide flange girders and columns which in turn shall be supported on conventional concrete spread footings.
- The lateral load resisting system of the Chiller Plant shall consist of rigid concrete filled metal deck diaphragms spanning to perimeter and/or interior steel braced frames. Steel braced frames shall be detailed as "steel special concentrically braced frames" in accordance with building code requirements.
- The power generator yard shall consist of a reinforced concrete slab on grade under the generator surrounded crushed rock. A cantilever steel frame perimeter wall shall be constructed

This document is in draft form. The contents, including any opinions, conclusions or recommendations contained in, or which may be implied from, this draft document must not be relied upon. GHD reserves the right, at any time, without notice, to modify or retract any part or all of the draft document. To the maximum extent permitted by law, GHD disclaims any responsibility or liability arising from or in connection with this draft document.

to support perimeter metal mesh curtain screen wall system. There shall be a concrete driveway along the north side of the power yard connecting the chiller plant with the gate on the west side of the yard. There shall be gates provided as indicated on the plans to allow access to the yard for maintenance purposes and delivery of equipment.

- Central Power PlantChiller PlantChiller PlantChiller PlantDead loads of different construction materials for use in determining self-weight shall be used as per the below:
 - Concrete 150 pcf
 - Steel 490 pcf
 - Aluminium 169 pcf
 - Fiberglass 100 to 115 pcf
 - Wood 40 pcf
 - Masonry, concrete block, solid grout, 8 inches 75 psf (light weight)
- The following live loads shall be used:
 - Electrical equipment rooms 250 psf
 - Mechanical equipment rooms 250 psf*
 - * But not less than the actual equipment weight
 - Offices, restrooms, locker rooms, etc, 50 psf or 2000 lb Load
 - Partition Load 15 psf
 - Stairs and walkways 100 psf or 300 lb Tread Load
 - Storage areas 125 psf
 - Roof load 20 psf (reducible)
 - Cranes/Monorails as Required
- The following wind load criteria shall be used:
 - Basic wind speed 115 mph
 - Exposure C
- The following seismic load criteria shall be used (Note: the following values are preliminary and are to be verified based on a geotechnical analysis):
 - Occupancy Category IV
 - Mapped spectral accelerations SS = 1.48, S1 = 0.54
 - Seismic importance factor 'I' 1.5
 - Soil profile type D
 - Seismic Design Category D
- All structures shall be designed using the load combinations as stated in the 2013 CBC. Because traffic loads are infrequent, vehicle loads shall not be designed for using the load combinations stated in AASHTO, but instead shall be incorporated into 2013 CBC load combinations as a live load.
- The design build team shall incorporate provisions to provide compliance for building #20 and the Chiller Plant with respect to fire separation distance (Table 705.8 CBC) from a property line. This may include upgraded protection of building #20 openings and/or exterior wall, a separation wall or both.