SAN FRANCISCO DATA CENTER

400 Paul Avenue — Basis of Design

NOVVA

SITESPAN

CAC ARCHITECTS

MICHAUD COOLEY ERICKSON ENGINEERING SOLUTIONS

Thornton Tomasetti

SAN FRANCISCO DATA CENTER AT-A-GLANCE

SECURITY

SITE: Perimeter Fence / Razor Wire
Entrance Gate Authorization
ACCESS: Two Factor Authentication, Mantrap Entrance
CAMERAS: 100% Site And White Space Coverage
PERSONNEL: 24/7/365

EFFICIENCY

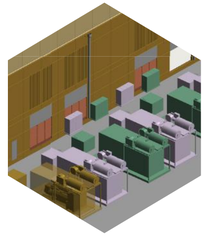
CONTAINMENT: Hot Isle Containment
MISSION CRITICAL COOLING: Air Cooled Chillers, Water Side Economizer, 100% Free Cooling 78% of Hrs/Yr, Partial Free Cooling 22% of Hrs/Yr, Peak PUE (Mech): 1.282 Annualized PUE (Mech): 1.051
ELECTRICAL: (6) Tier II Generators, (12) Tier IV Generators, High Efficiency UPS: 96% Double Conversion 99% Econoversion, Lithium-Ion Batteries
LIGHTING: LED, Lighting Controls

FACILITY

IT POWER: Phase 1: 3.6MW, Full Build 14.7 MW
TOTAL SIZE: 242,941 SF
WHITE SPACE: 136,000 SF
STORIES (DATA HALL): 2
STRUCTURE: Steel Beams, Steel Deck, Seismic Design Catergory D
ROOF: TPO Membrane W/Polyiso Insulation
FLOOR TO FLOOR HEIGHT: Level 1: 20'; Level 2: 20'
WHITE SPACE CEILING HEIGHT: Level 1: 11'; Level 2: 13'-6"
LOADING DOCK: Dock Leveler: 25,000 LB
SERVICE ELEVATOR: 15,000 LB
CONNECTIVITY: Carrier Neutral, Low Latency

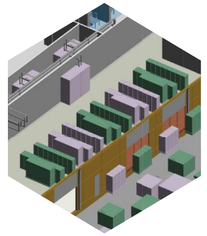
RELIABILITY

1.



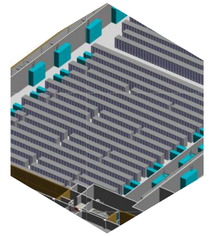
UTILITY POWER: (2) 12 MW Services (PG&E)
1 **GENERATOR POWER:** (18) 2 MW

2.



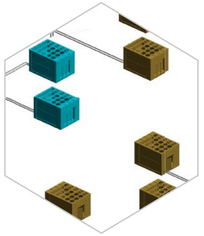
ONSITE FUEL STORAGE: 3600 Gal/Generator, Double Wall Belly Tank, 24 Hr Runtime

3.



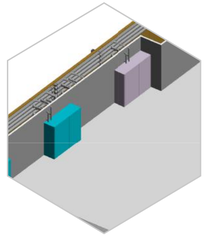
2 **UPS:** 1500 KW Per UPS, 4=3 Redundancy Blocks, Full Build: (4) Total Blocks, Distributed Redundant

4.



3 **PDU:** 300 KW Distributed Redundant
4 **MECHANICAL:** Full
5 Build: N+2 Chillers, N+3 Fan Wall Units

5.



FIRE PROTECTION: Double Interlock Pre-Action, VESDA
DCIM/BAS CONTROLS: EntroCIM

SAN FRAN CISCO

400 Paul Avenue
San Francisco, CA

SITE AREA
6.62 ACRES
288,367 SF

ZONING
PDR-2

Building Type: 3B

Height & Bulk: 65J

Occupancy:
B&S2

BUILDING A

Total: 14,051 SF +/–
Level 1: 7,054 SF +/–
Level 2: 6,997 SF +/–

BUILDING B

Total*: 42,660 SF +/–
Level 1: 14,353 SF +/–
Level 2: 14,353 SF +/–
Basement: 13,954 SF +/–

**Includes Connector AB*

BUILDING C

Total*: 186,230 SF +/–
Level 1: 93,115 SF +/–
Level 2: 93,115 SF +/–

**Includes Connector BC*

TABLE OF CONTENTS

NOVVA

BUILDING A/B

INTERIOR

The improvements are focused primarily on Level 1, with the creation of an expansive lobby and conference/office area on the east side, a secure path back to the BC connector and provisions for future support spaces on the remainder of the floor. The basement level and Level 2 will remain unfinished.

The Lobby/Conference Area will be an open plan area containing lobby with reception desk and lounge seating, five private offices, one enclosed conference, one open conference room, a juice bar along the east wall and a new glass-enclosed feature stair in the middle of the space that will connect with Level 2. It will have open access to the building bathrooms, which will be completely built out, and controlled access to a new stair to Level 2, the elevators, and the BC connector. The new public spaces will have a technological look and feel, with use of glass, metal and other materials and finishes. The wood ceiling in Building A and the concrete ceiling of Building B will be left exposed, with acoustic 'clouds' located to optimize acoustic performance and to screen ceiling

mounted mechanical and electrical equipment as appropriate. Holes will be cut in the second level around windows to create connection with, and bring more natural light, to Level 1.

Other than completion of the base building elements (including stairs, shafts and minor cleaning), there is no work in the basement or on Level 2 during this phase.

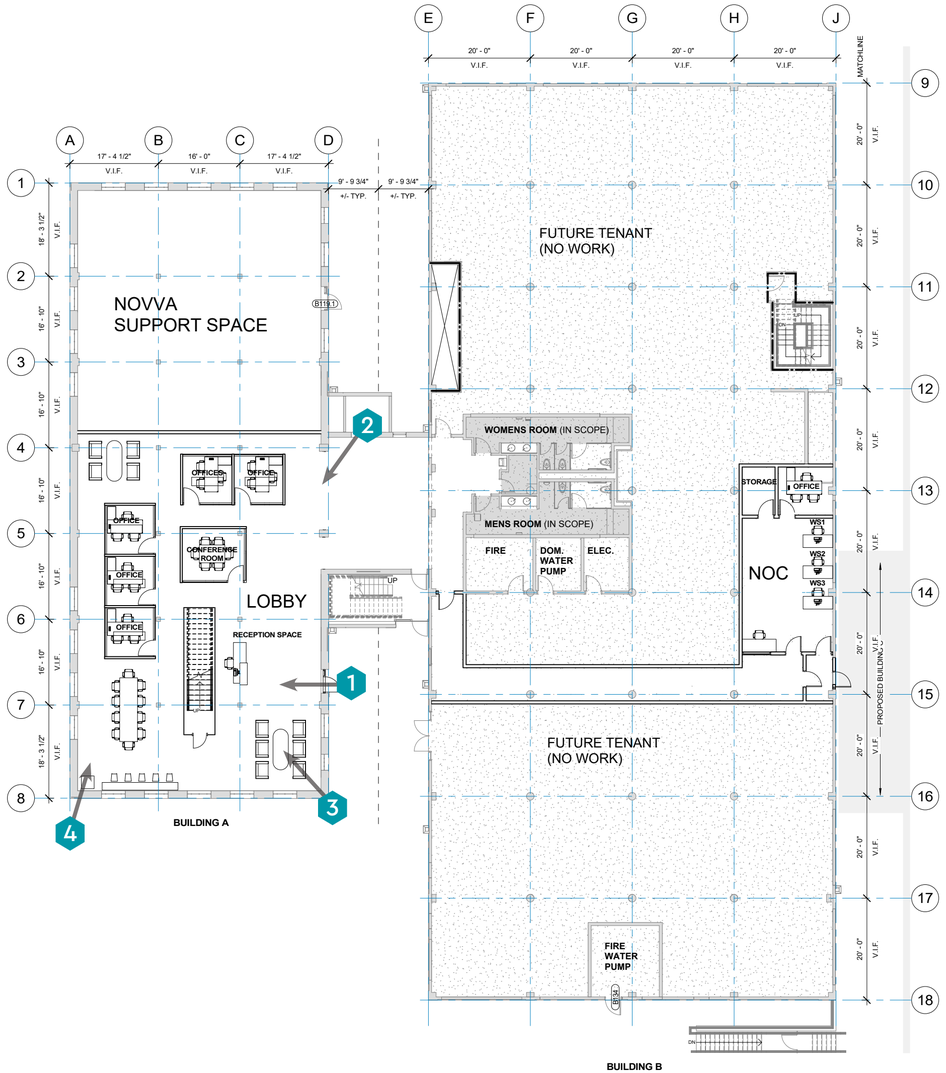
EXTERIOR

A new front door will replace the existing window on the north side, along column line A between columns 6 and 7, and windows above this area will be replaced (located on Level 2). A new canopy will be added over the door, and the partially completed canopy at Building B will be finished in the future, including the addition of outdoor seating and tables.

This work will also include either the renovation or replacement of the existing windows on Building A, concrete cleaning and painting and balcony repair (to be determined as "Conditions of the Approval" or amended in later conversations with the city).

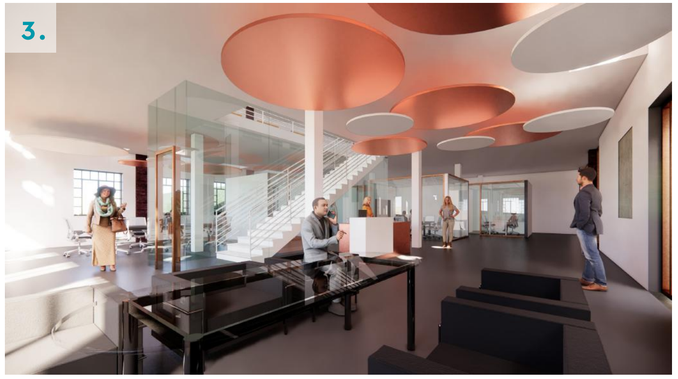
BUILDING A/B - LEVEL 1 FLOOR PLAN

1.



2.

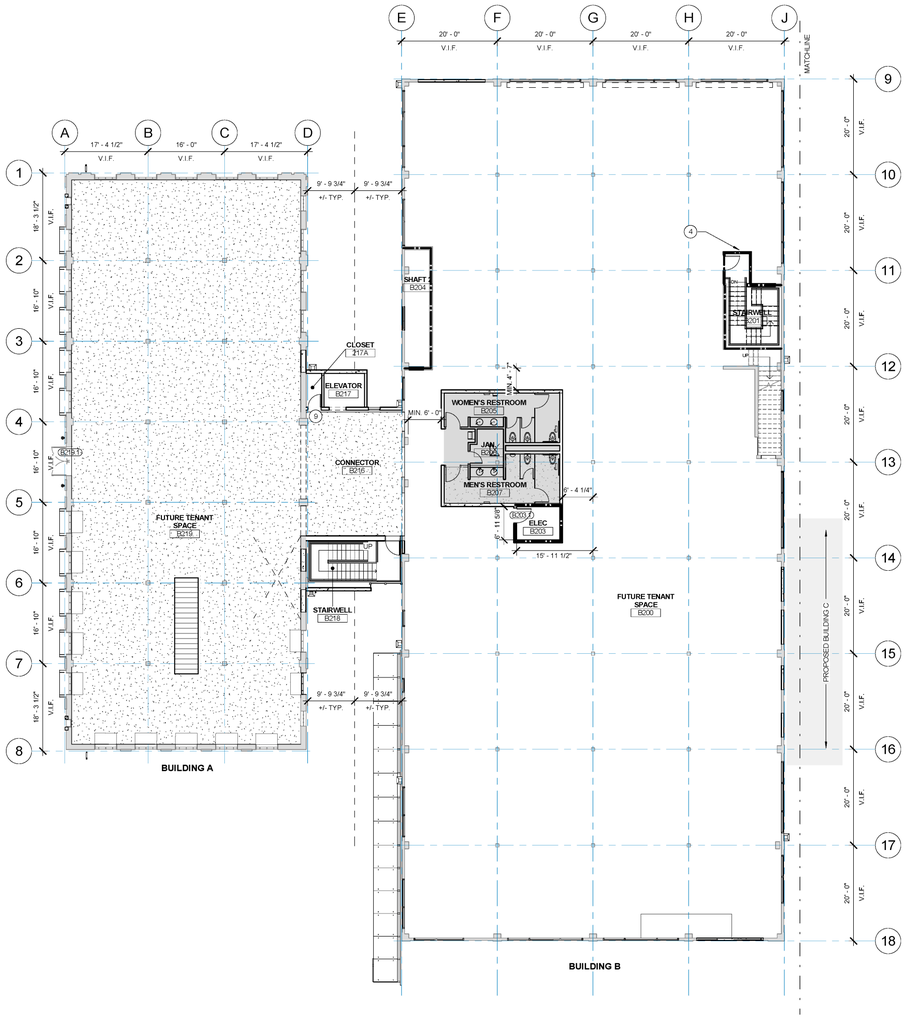
3.



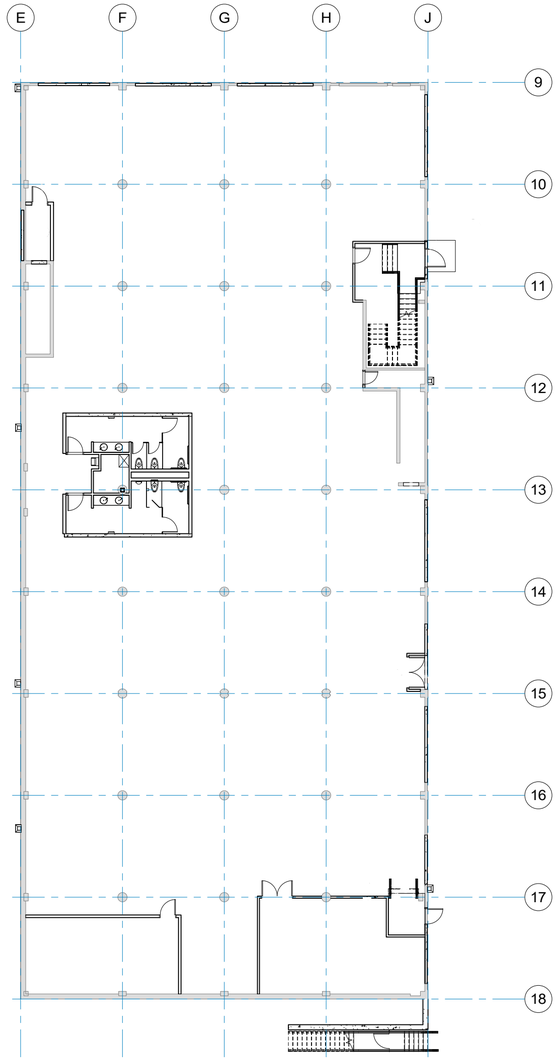
4.

Please refer to page 54 for full page plans and renderings.

BUILDING A/B - LEVEL 2 FLOOR PLAN



BUILDING B - BASEMENT FLOOR PLAN



BUILDING C

INTERIOR

This phase includes the data hall with mechanical gallery, electrical rooms, UPS rooms, and east and west MMRs, entry lobby and support spaces to transform the space into a fully operational and highly-efficient data center, all built on a 30" raised floor.

The lobby and support areas are located on the north side of the facility and feature two large conference rooms and a break room. Adjacent to this space is an open lounge area which leads to the main lobby. Two man-traps and bathrooms are located just outside the secure area, with two single-use bathrooms and one shower and locker room located just inside of the secure area. A network operations center (NOC) with seating for six, a private office, storage closet, and four OPS offices is adjacent to the lobby.

The location of the front door has been determined by the open area beneath the brace along column Line Y between columns 21 and 22. In order to maximize natural light into the lobby, we have utilized the existing windows to determine where the lobby is located.

The main elevator (#1) is a 15,000 lb. service elevator. The other elevator (#2), in the BC Connector, is a passenger elevator.

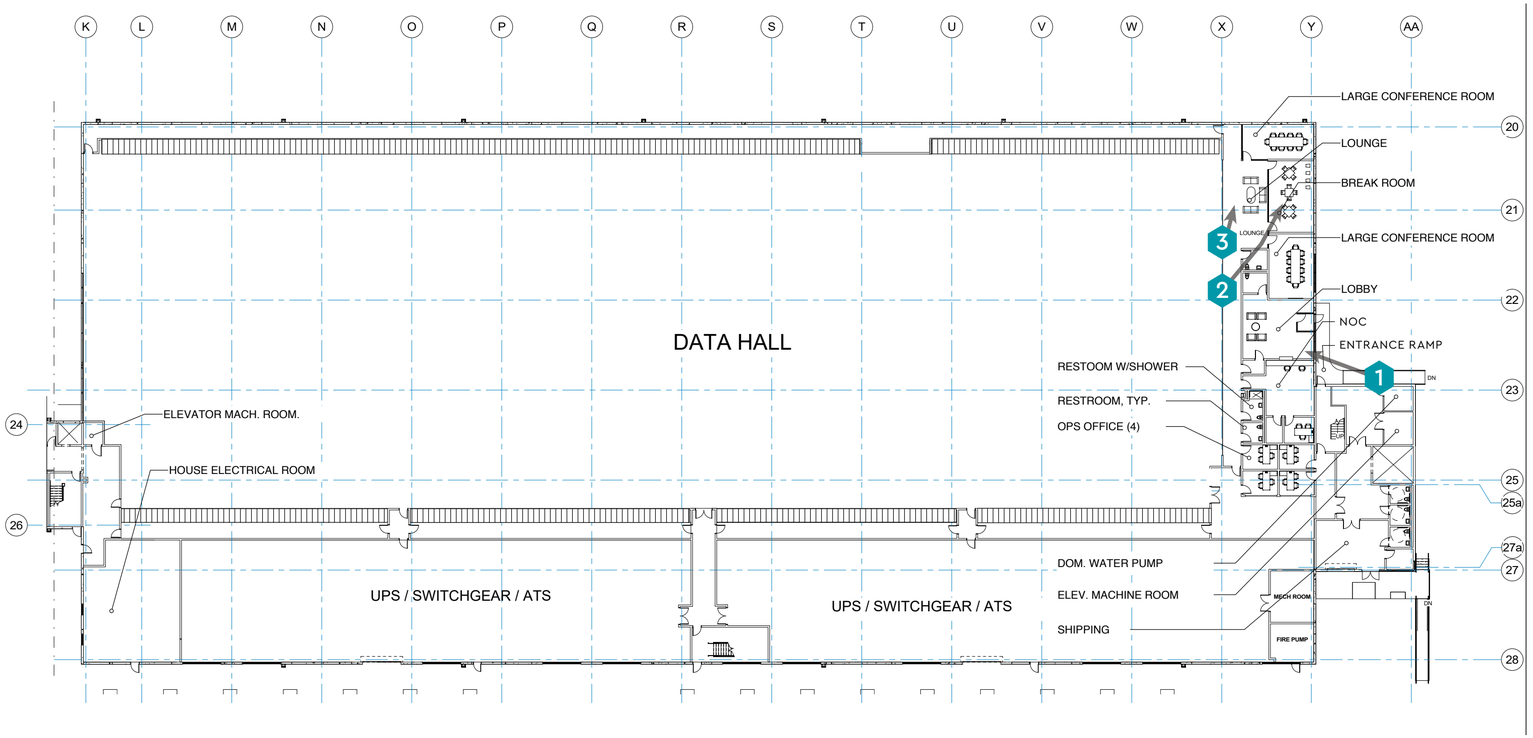
EXTERIOR

Overlapping the existing stair exit is a new ramp and walkway that will lead to the new front entrance. Enhanced paving and three-dimensional elements including handrails and a canopy complement the exterior and highlight the entrance.

Louvers will be installed along the east façade, to supply air to the electrical equipment. On the north façade new glazing will be installed into the two openings in the pre-cast concrete panels to allow light to permeate the interior.

Please note that base conditions for the existing shell and site are as of March 30,2021 and these scopes of work may still be amended.

BUILDING C - LEVEL 1 OVERALL PLAN



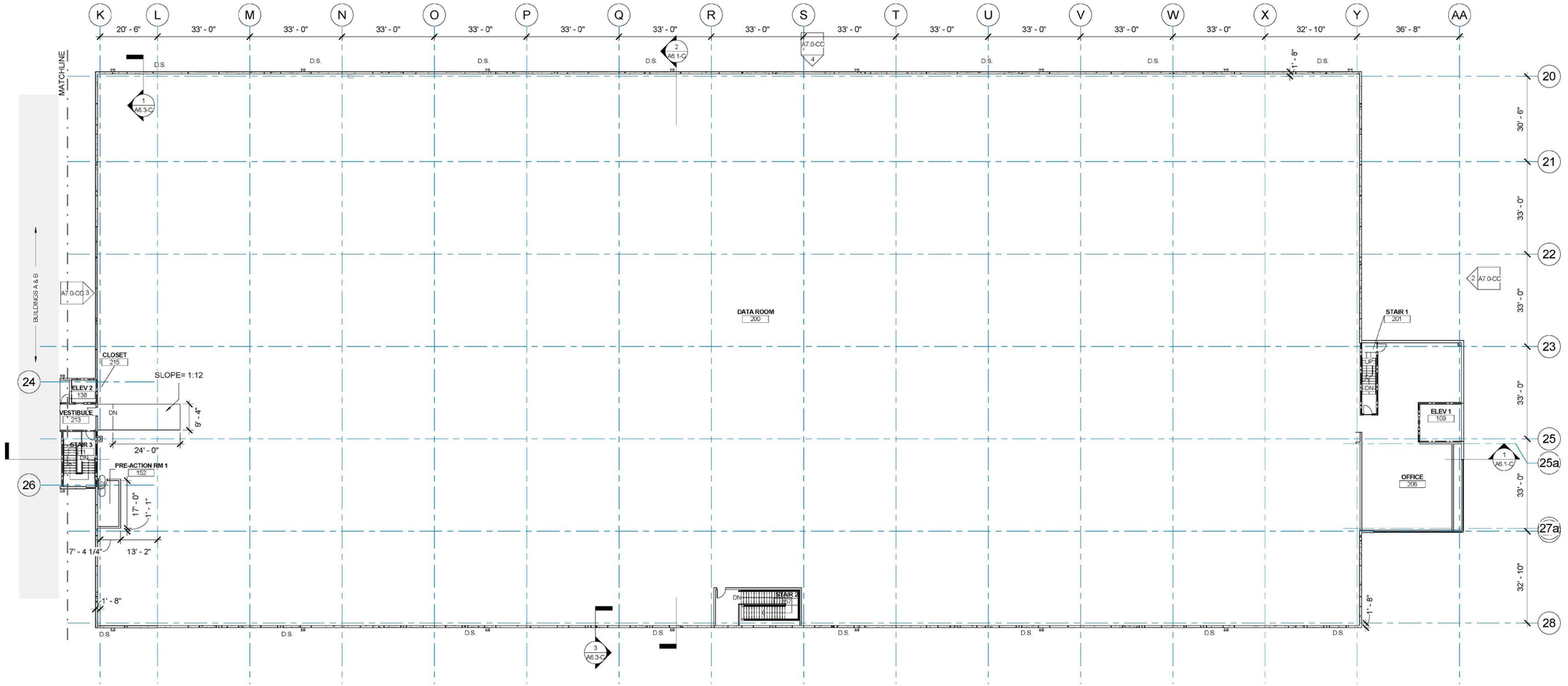
Please refer to page 53 for full page plans and renderings.

1.

2.

3.

BUILDING C - LEVEL 2 FLOOR PLAN

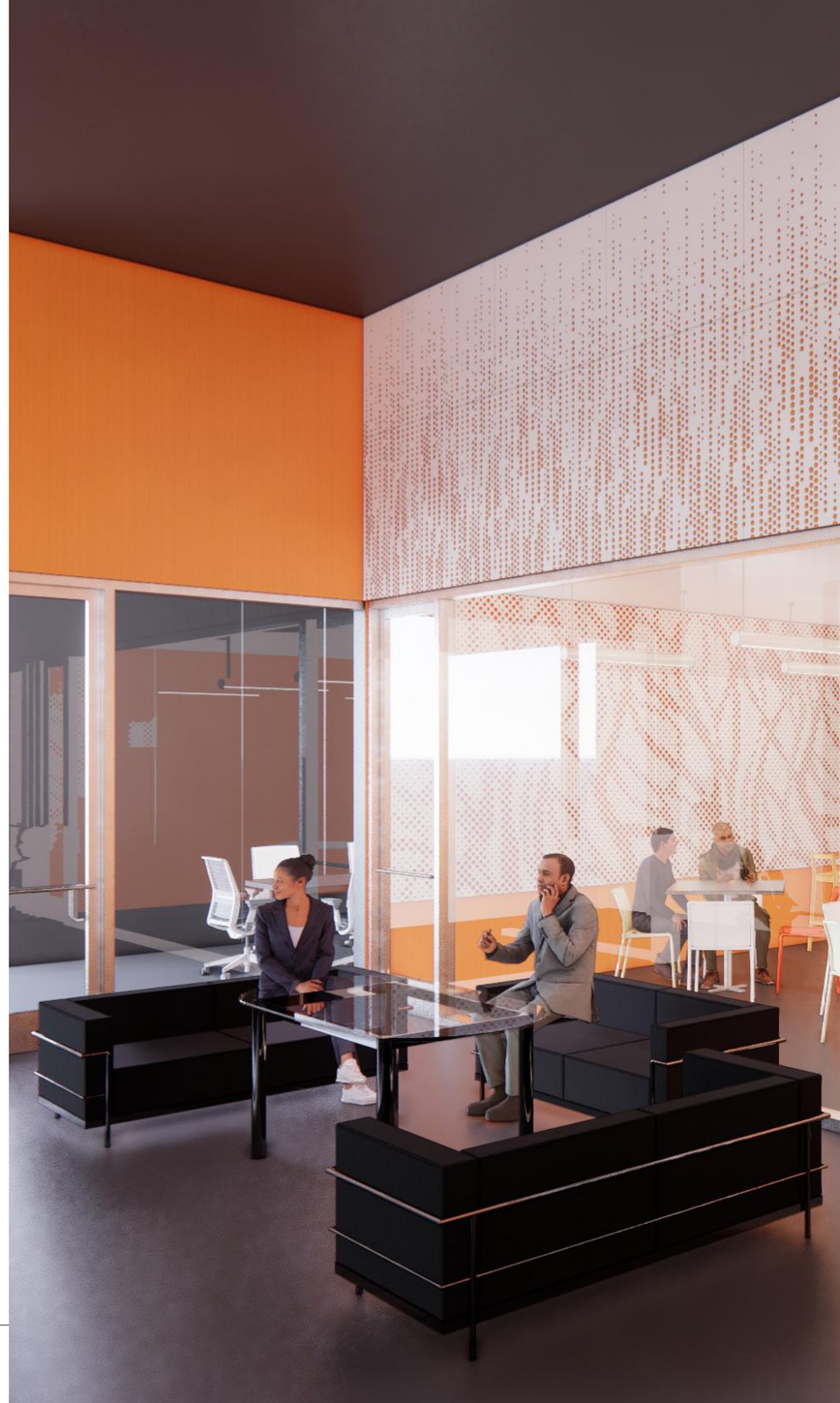


ARCHITECTURAL BASE BUILDING STANDARDS

BUILDINGS A,B,C

1. All spaces use Base Building finishes unless otherwise indicated (referred to as base building, or 'BB'). These finishes will generally be used for all spaces outside of feature areas and will include corridors, electrical rooms, mechanical rooms, elevator machine rooms, etc. The precise finishes and equipment will be determined in later phases. Feature colors will be based on the NOVVA brand standards, including Teal (RGB 0099AB) and Amber (RGB 856B2A). Portions of the base building, including stairs, bathrooms, etc., will be completed during this phase and including in the base building finishes. The palette and materials are inspired by the existing NOVVA facility and are meant to continue brand identity, but some colors and finishes will be adjusted to be harmonious with the existing site conditions.

2. Equipment:
    a. Fire Extinguishers: TBD
    b. Fire Extinguisher Cabinet: TBD
    c. Elevator: Need for new finished TBD
3. Floor
    a. Carpet: (Mohawk Harmony or Milliken These, see individual rooms)
    b. Epoxy: TBD
    c. Ceramic Tile: TBD
    d. Vinyl Tile: (Shaw 'Natural Choreagraphy)
    e. Exposed Concrete: Sealant TBD
    f. Raised Floor: Hayworth Global LFS
4. Resilient Base: Roppe Contours Candid 4060
5. Walls
    a. Sheetrock
        i. Base Color: SW 7005 Pure White (Verify)
        ii. Accent Color 1: Brand Color Teal
        iii. Accent Color 2: Brand Color Brown
    b. Ceramic Tile
        i. Field Color: TBD
        ii. Accent Color: TBD
6. Window Treatment: Mecco Shades, manually controlled
7. Doors
    a. Size: 3'x9', typical
    b. Construction: Wood
8. Ceilings
    a. Exposed Metal Ceilings: SW 6258 Tricorn Black
    b. Suspended Acoustic Ceiling: Rockfon Artic Square Tegular Narrow, Satin Silver frame
    c. Suspension Acoustic: Armstrong Tectum Clouds
    d. Wood Grill Ceiling: Armstrong Woodwoorks, Walnut
9. Casework
    a. Faces:
        i. Thermofoil Ammati Walnut 12
        ii. Thermofoil Black
    b. Countertop
        i. Daltile One Quartz Meteor Shower
        ii. Daltile One Quartz Morning Frost



BUILDINGS A+B ROOM SCHEDULE

SPACE	DESCRIPTION	SIZE	ADJACENCIES	EQUIPMENT	FINISHES				WINDOW TREATMENT
					FLOOR	BASE	WALLS	CEILING	
Lobby	• Open plan area containing reception desk, seating, private offices, conference rooms, juice bar, access to bathrooms, secure access to BC connector, secure access through glass-enclosed stair to level 2 of building A. • The ceiling will be cut open in areas above the windows to establish a connection between the floors.	• Approx. 3,800 SF (includes conference rooms and open/flexible meeting spaces) • 6 person seating	• Main entrance • Restrooms • Security • Conference rooms • Private offices • Juice bar	a. 6-8 Seats b. Table c. Open reception/ security desk	• Patch existing concrete • Stain and finish • Seal	• Roppe • Contours Candid 4060	Sheetrock • Color TBD Concrete • Patch and repair as required	Armstrong Tectum Clouds, wood ceiling above to be clear sealed	Mecco Shade
Enclosed conference room (lobby area)	• Enclosed conference room for use by staff and visitors • Located beyond reception desk but outside of security	• Approx. 150 SF • 6 person seating	Lobby	a. 1 Conference room table b. Six chairs c. White board d. Flat screen TV	• Milliken 'Color Theses' Series		Painted • Color TBD	Rockfon Artic Square Tegular Narrow	None
Open conference room (lobby area)	• Private office (1 emp. and 2 visitors) • Acoustic and visual separation • 2 solid walls • 2 glass walls, 6' frosted • Glass door	• Approx. 100 SF	Lobby	a. 1 Conference room table (min. cap. of 12) b. 12 chairs c. White board	• Existing concrete • Stain and seal		None	Armstrong Tectum Clouds, wood ceiling above to be clear sealed.	None
Offices (lobby area)	• Private office (1 emp. and 2 visitors) • Acoustic and visual separation • 2 solid walls • 2 glass walls, 6' frosted • Glass door	• Approx. 100 SF	Lobby	a. Seating: 1 for emp. And 2 for guests b. 1 desk	• Milliken 'Color Theses' Series. (note: These offices are ones with upgrade from Mohawk Harmony)		Sheetrock • Color TBD	Rockfon Artic Square Tegular Narrow.	Frosted up to 7'

SPACE	DESCRIPTION	SIZE	ADJACENCIES	EQUIPMENT	FINISHES				WINDOW TREATMENT
					FLOOR	BASE	WALLS	CEILING	
Juice bar (lobby area)	• Countertop with seating • Informal break area	Approx. 200 SF	• View of bioswale • Large conference table	a. Wall-mounted table b. 6 Chairs	• Existing concrete • Stain and seal	• Roppe • Contours Candid 4060	Concrete • Patch and repair as required	Armstrong Tectum Clouds, wood ceiling above to be clear sealed	Mecco Shades
Seating area (semi-private)	• Informal seating area • SW corner of lobby • Isolated from main entrance		• Office • Conference room		Milliken 'Color Theses' Series		Sheetrock • Color TBD		Mecco Shades
AB elevator lobby	• Area in AB connector outside of stairway and elevator • Links the open lobby to secure hallway to BC connector and building C	Approx. 300 SF	Lobby	None	Existing Concrete • grind down to even surface • stain and seal		Utah themes (wallpaper or murals)		No shades on window
Secure hallway	• Located beyond security • Connects to open/unsecure lobby to NOC that controls access to BC connector. • Hallway is enlarged at NOC to provide waiting area for credential check	Approx. 600 SF	Between lobby and security man-trap		Existing Concrete • stain and seal		BB	Exposed concrete	N/A
AB Network Operations Center (NOC)	• Access to building C through the BC connector is controlled at this point	Approx. 700 SF	• Lobby • BC connector	a. Built-in cabinetry b. Security glass with pass-through window c. 3 (6x6) workstations	Carpet: Mohawk 'Harmony' Series		Sheetrock • Color TBD	Rockfon Artic Square Tegular Narrow. 'Satin Silver' frames	N/A
Mantrap	• Located in building B • Secure transition space from secure hallway to BC connector	Approx. 50 SF	Lobby	2 glass security doors	• Patch existing concrete • Stain and finish • Seal		Sheetrock • Color TBD	Rockfon Artic Square Tegular Narrow. 'Satin Silver' frames	N/A
NOVVA support space (building A)	• Unfinished space at west side of building a level 1 • Future administrative support areas	Approx. 2,300 SF	None	None	Existing Concrete • stain and seal		N/A (No work this phase)	N/A (No work this phase)	N/A (No work this phase)

SPACE	DESCRIPTION	SIZE	ADJACENCIES	EQUIPMENT	FINISHES				WINDOW TREATMENT
					FLOOR	BASE	WALLS	CEILING	
Open tenant areas building A (level 1 and level 2)	Level 1 unfinished future tenant spaces Work to include: • Maintain clear ADA path to stairs.	Existing	Elevator	None	No work	None	Sheetrock patched and primed, ready for paint	Exposed, no work	N/A
Restrooms (level 1)	• Existing bathrooms to serve entire floor	Existing	• Central location • Near break room	a. Toilet partitions: Hadrian Standard Series (floor mounted, brushed stainless steel) b. Sanitary napkin dispenser: Bobrick b-3706 recessed c. Grab bars: Bobrick b-6806 series, SS d. Toilet seat cover/san. napkin disp./toilet tissue combo (partition mtd): Bobrick b-357, W e. Toilet seat cover/san. napkin disp./toilet tissue combo (recess mtd. In wall) b-3574 W f. Toilet seat cover/toilet tissue combo (partition mtd) Bobrick b-347, M g. Toilet seat cover/toilet tissue combo (recess mtd. In wall) b-3471, M h. Auto soap dispsr: Bobrick b826 i. Combo paper towel & waste container: Bobrick b-369 j. Lockers: TBD k. Countertop: Quartz or similar			Ceramic Tile (below 7'): TBD Painted Sheetrock (above 7'): • Color TBD	Painted gypsum board	N/A
Stairwell B 001, 101, 201	• Located on N side of building B • Complete enclosure of stairwell at all levels (meeting exiting code requirements) including walls and doors.	Existing	Existing	Stair (existing)	Concrete, sealed	Roppe Contours Candid 4060	Stair: base color Walls BB (field)	Exposed: • Painted: color TBD	N/A
Stairwell b118, 2118 (in ab connector)	Painting and finish work to existing stair and shaft. Must be brought to code, including installation of interior doors and hardware	Existing	Existing	Stair (existing)	Existing Concrete • stain and seal	N/A	Stair: base color Walls BB (field)	Exposed: • Painted: color TBD	N/A

SPACE	DESCRIPTION	SIZE	ADJACENCIES	EQUIPMENT	FINISHES				WINDOW TREATMENT
					FLOOR	BASE	WALLS	CEILING	
BB Infrastructure Support Rooms	a. Basement: i. electrical room b220 b. Building B, Level 1: i. fire pump room 134 ii. domestic pump room 135 iii. fire pump room 136 iv. electric room b103 c. Building B, Level 2: i. electric room 203	Existing	Close to elevator	Per manufacturer	Existing Concrete • stain and seal	Roppe Contours Candid 4060	Painted Sheetrock: BB White	• Exposed Concrete in Basement and L1 • Exposed wood on L2	N/A
Restrooms	Basement and Level 2 of building B • No work this phase	Existing			N/A				
Shaft 104 and Shaft 204	• Install 2'x2' access panel at east side at level 1 and level 2 • Safety netting on inside of access platform	Existing	Existing	None	N/A				
Open Tenant Area	• Located in the basement and level 2 of building B • No work this phase except as noted for BB services	Existing			N/A				
Bulidng B Tenant Spaces	• Level 1 and level 2 • Sheetrock prep for paint and finish by future tenants				N/A				
Building A Shell Windows	• Either renovate or replace all windows • See report from architectural resources group • Repair Juliet Balconies	See report by Architectural Resources group							
Building A Exterior Concrete Base	• Clean and paint base								

SPACE	DESCRIPTION	SIZE	ADJACENCIES	EQUIPMENT	FINISHES				WINDOW TREATMENT
					FLOOR	BASE	WALLS	CEILING	
Building A Additional Shell Modifications	• Add canopy over new front door • Repair exposed brick on north side along AB Connector • Replace or repair front door • Re-install or replace window above new entry • Repair Flagpole above front door	See Architectural Drawings Conformed Set							

BUILDING C ROOM SCHEDULE

SPACE	DESCRIPTION	SIZE	ADJACENCIES	EQUIPMENT	FINISHES				WINDOW TREATMENT
					FLOOR	BASE	WALLS	CEILING	
Lobby	• Entry, commons and reception • High-tech with location themed architectural elements and materials (natural elements from Utah) • Secured entrance and exists, including mantraps • Aesthetic should compliment the existing exposed diagonal brace	• Seating for 4-6 people • Approx. 525 SF net of Mantrap 1	• Mantrap 1 at Entry • Single Use Restroom • Security Operations Center • Mantrap 2	a. 4 chairs b. Table c. Countertop/solid surface at security window d. Wall-mounted TV	Milliken 'Color Theses' Series	Roppe Contours Candid 4060	• West wall with Utah mural • Other walls BB white + other accent color (TBD)	• Armstrong Tectum Clouds • Exposed metal ceiling above painted BB black	Mecco shade (model TBD)
Mantrap 1	• Transition space from outdoors to secure lobby • All-glass (except for the ceiling) will preserve and enhance the exterior view for both aesthetic and security purposes	40-50 SF	• Lobby • Connection to NOC Window	2 glass security doors	Walk-off matt with recessed drain	(glass storefront system, no base)	Glass	Painted Sheetrock: • BB White	N/A
Mantrap 2	• Secure transition point from lobby to Data Hall and support spaces beyond • Introduction to the main tenant spaces • Should avoid claustrophobic or oppressive feel	40-50 SF	• Lobby • NOC Window	2 glass security doors	Accent Carpet (similar to lobby) Milliken 'Color Theses' Series	BB: • Roppe Contours Candid 4060	BB White Accent (color TBD)	Rockfon Artic Square Tegular Narrow 'Satin Silver' frames	
Restroom	• Restroom available to visitors outside of the secure zone of the building • Tile finishes similar to interior single-use bathrooms used by employees	60-70 SF	• Lobby • Exterior glass	• See previous table; Pg. 11, Row 2, a-i a. Mirror	Crossville ceramic tile or equal (color and model TBD)	Crossville ceramic tile or equal (color and model TBD)	Crossville ceramic tile or equal (color and model TBD) • tile to 7' • ptd. sheetrock above	Painted Sheetrock	

SPACE	DESCRIPTION	SIZE	ADJACENCIES	EQUIPMENT	FINISHES				WINDOW TREATMENT
					FLOOR	BASE	WALLS	CEILING	
Building C Network Operations Center (NOC)	• Access to the building is controlled from this space • It should have a clear, unobstructed view to lobby and front door but no exterior windows • Accommodates 4-6 people at desk, private office and open workstations	500-600 SF	Lobby, Mantrap	a. Built-in cabinetry b. Security glass with pass-through window c. Seating: 3-4 Workstations d. One private office, approx. 100 SF e. One secure storage room, approx. 50 SF f. Countertop/Solid Surface	Mohawk 'Harmony' Series Carpet	Roppe Contours Candid 4060	BB White, Accent color TBD	Rockfon Artic Square Tegular Narrow. 'Satin Silver' frames	N/A
Large Conference Room	• Enclosed Conference Room • In secure area • 1 rooms should have exterior glass	Total Qty 2, each with: • Seating for 12 • Approx. 375 SF	• Lobby • Break Room • Lounge	a. One conference room table b. 12 chairs c. White board d. Flat screen TV	Mohawk 'Harmony' Series Carpet	Roppe Contours Candid 4060	BB White, Accent color TBD	Rockfon Artic Square Tegular Narrow. 'Satin Silver' frames	Mecco Shades
Break Room	• Employee breaks and lunch area • Seats 12-15 • Includes tables and a bar • Welcoming and relaxing atmosphere, with a variety of seating options	400-450 SF	• Central location • Conference Rooms • Restroom	a. Cabinets b. Sink c. Refrigerator d. Microwave e. Paper Towel Dispenser f. Coffee Machine g. Water Filter h. Soap Dispenser i. Furniture i. 2-3 tables (ea seating 4) ii. Chairs: 12-16 iii. Lockers: TBD	LVT Shaw Cut 'Natural Choreography Series'	Roppe Contours Candid 4060	BB White, Accent color TBD	Rockfon Artic Square Tegular Narrow. 'Satin Silver' frames	N/A

SPACE	DESCRIPTION	SIZE	ADJACENCIES	EQUIPMENT	FINISHES				WINDOW TREATMENT
					FLOOR	BASE	WALLS	CEILING	
Lounge	• Informal gathering area outside of Break Room and Conference Rooms • Has a view into the Data Hall	• Seats 4-6 ppl • Approx. 525 SF net of Mantrap 1	• Conference Rooms • Break Room • Restroom	a. 4-6 lounge chairs b. Table	Milliken 'Color Theses' Series Carpet	Roppe Contours Candid 4060	BB (field) • Accent color TBD	Armstrong Tectum Clouds • Exposed metal ceiling above painted black	N/A
Support Area Corridor	• Located on north side • Outside of security • Connects break/conference area to the Data Hall and shipping • View into Data Hall thru glass wall • Open w/emphasis on racks		• Support areas • Data Hall • Shipping	a. Lockers for users (qty TBD)	Milliken 'Color Theses' Series Carpet		• Clear glass on south to view Data Hall • North wall ptd. sheetrock (color tbd)	Wood Grill Ceiling • Thermofoil painted black above	
Operations (OPS) Offices	• Offices for Data Center support staff	Total Qty 4, each: • 90-100 SF	• NOC • Data Hall • Conference Rooms • Break Room	a. Desk b. Two chairs	Mohawk 'Harmony' Series Carpet		BB White	Rockfon Artic Square Tegular Narrow. 'Satin Silver' frames	
Fire Pump Room 160	Pump for Fire Suppression System • expanded for installation of pre-action system	Approx 200 SF		See Mechanical	Epoxy		BB White	Exposed: • Painted BB black	
Restrooms (except at loading dock)	• Restrooms behind security • Available to staff and visitors • Should match look and feel of Building B restrooms	Total Qty 3, each: • 60-70 SF	• Divided with some near OPS offices and some near conference and break room	• See previous table; Pg. 11, Row 2, a-i	Ceramic Tile	Ceramic Tile	Ceramic Tile (below 7'): TBD Painted Sheetrock (above 7'): • Color TBD	Painted gypsum board • BB white	
Janitor's Closet	• Service closet with mop sink and storage shelves	35-30 SF	• Near plumbing fixtures	a. Mop Sink b. Storage shelves	Sheetrock, painted	Roppe Contours Candid 4060	• Up to 4': standard FRP Marlite panels w/PVC trim and base molding • Above 4': Painted BB (Field)	Exposed: • Painted Black	

SPACE	DESCRIPTION	SIZE	ADJACENCIES	EQUIPMENT	FINISHES				WINDOW TREATMENT
					FLOOR	BASE	WALLS	CEILING	
Shipping 101	• For reception and uncrating of deliveries	Existing	• Loading Dock • Service Elevator	Double doors (2-three foot leaves) on access path of rack deliveries	Sealed concrete	Roppe Contours Candid 4060	BB white	Painted Black	Meccho Shade, Manual control
Restroom (at Loading Dock)	• Restroom outside of security • For truck driver use	Existing	Shipping	a. Toilet: (see mechanical) b. Sink c. Combo Paper/Seat Cover/Sanitary Disposal Unit d. Mirror e. Soap dispenser	Sealed concrete		a. Marlite Panels (below 7') b. Painted sheetrock: Painted BB White (above 7')	Painted Sheetrock • BB White	N/A
Elevator Lobby (Levels 1,2 and Roof)	• Area outside of elevator doors • Needs sheetrock installation	Existing	Close to Elevator		Stained and Sealed		a. Painted BB White b. Accent Color: TBD	Painted BB Black	
Data Hall (Rm. 100)	• Large open area contains racks, fan wall and service gallery behind fan wall (see electrical, mechanical)	Approx. 63,000 SF	• Electrical Rooms UPS/Switchgear Room • Elevator #1 (from Shipping)	See Mechanical/ Electrical	Haworth Global IFS		Add sheetrock to concrete walls below ceiling • Base Color • Accent TBD	Rockfon Artic Square Tegular Narrow. 'Satin Silver' frames.	
Main Electrical Room	• Contains UPS, switchgear, other electrical equipment to service Data Hall		• Data Hall • Exterior wall for air louvers	a. UPS b. Switchgear c. Electrical	Haworth Global IFS		BB (Field)	Exposed: • Painted Black	
East MMR (West Similar)	• Arrival and transition space for fiber			See electrical	Haworth Global IFS		Base color	Rockfon Artic Square Tegular Narrow. 'Satin Silver' frames	
Package Holding Room 107	• Temporary holding area for packages	Existing	• Shipping	None	Sealed concrete		BB (Field)	Exposed: • Painted Black	
Stair Rm 137 (Stair 3)	• Exist Stair from BC Connector	Existing	Existing	Stair: Accent Color TBD	Sealed concrete		Base Color	Exposed: • Painted Black	

SPACE	DESCRIPTION	SIZE	ADJACENCIES	EQUIPMENT	FINISHES				WINDOW TREATMENT
					FLOOR	BASE	WALLS	CEILING	
Stair Rm 153 (Stair 2)	• Exit Stair in middle of building along east side	Existing	Existing	Stair: Accent Color TBD	Sealed concrete	BB	Base Color	Exposed: • Painted Black	
Stair Rm 110 (Stair 1)	• Connects from Room to Level 1 at north end	Existing	Existing	Stair: Accent Color TBD	Sealed concrete	BB	Base Color	Exposed: • Painted Black	
Base Building Infrastructure Rooms	Level 1: • Pre-action Room 155 • Electrical Room 128 • Elevator Machine Room 156 (South Elevator in BC Connector) • Elevator Machine Room 108 (Elevator 1, North End) • Domestic Water Pump Room 161 • Elevator Equipment Room 108 • House Electrical Room 128 • Penthouse Room 300	All are base building support spaces	Existing	See MEP	Sealed concrete	BB	Base Color	Exposed: • Painted Black	
Building C Level 2 Tenant Spaces	• No work except stairs and shafts that pass through the space and described as part of Level 1 spaces								

BUILDING C

CODE: Designed to 2013 CBC
BASIC WIND SPEED: 115 MPH
WIND EXPOSURE: C

SEISMIC RISK CATEGORY: IV
SDS: 1.014 g
SD1: 0.694 g
SITE CLASS: D
SEISMIC DESIGN CATEGORY: D
SEISMIC IMPORTANCE FACTOR: 1.5
LATERAL SYSTEM: Buckling Restrained Braced Frames
RESPONSE MODIFICATION FACTOR: 8.0

DESIGN LOADS: See loading diagrams on pg. 46 for more information
ROOF (typical):
15 psf SDL
70 psf LL
Total Mech Equipt = 2700 kip
LEVEL 2:
10 psf SDL
250 psf LL

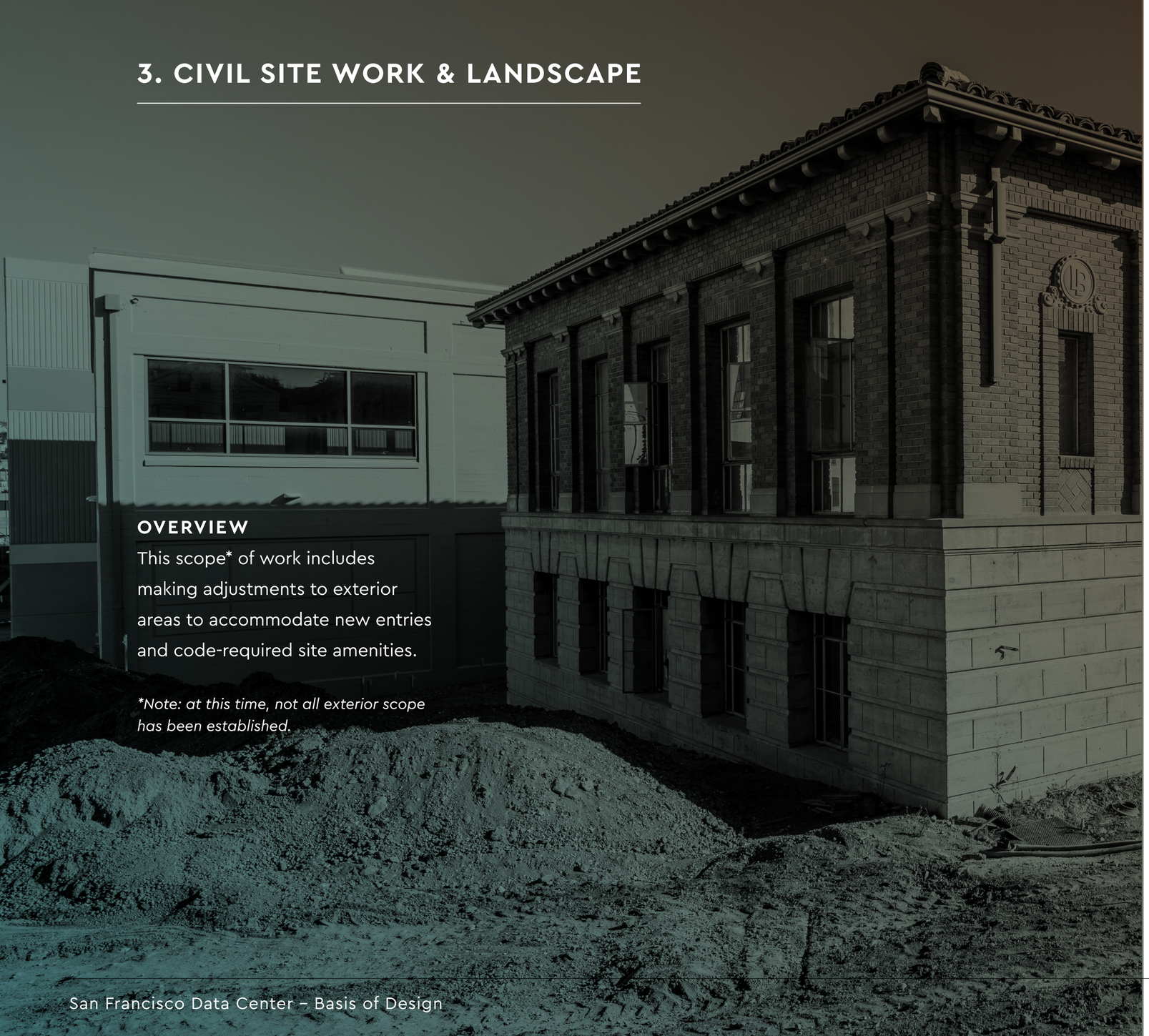
TYPICAL FRAMING
ROOF: 3 ¼" LWC over 2" metal deck (total thickness = 5 ¼") supported on W16 beams and W24 girders
LEVEL 2: 4 ¼" LWC over 2" metal deck (total thickness = 6 ¼") supported on W21 beams and W27 or W30 girders
LATERAL SYSTEM: BRBF located at the perimeter and on interior gridlines P and T

ROOF OVERVIEW

1. The new proposed rooftop equipment has more load density than the units which were the basis for the original design, meaning that the weight per area for the new equipment is higher.
2. The JWF-750 HRM units weigh an average of 122 psf while the design load for the roof includes 70 psf for the mechanical equipment. This added load means that review of the gravity system is required.
    a. Slab on Metal Deck: The wet weight is less than the capacity of the slab on metal deck, when downward loads are considered only. Depending on the support conditions of either a curb or a housekeeping pad, the reactions on each side of the unit may exceed the capacity of the slab due to load concentration and uplift at anchorage points. Coordinated positioning of the unit may resolve this issue.
    b. Typical W16 roof beams: The assumed wet weight will exceed the capacity of the typical roof beams unless the loading is distributed to two roof beams. Coordinated positioning of the units can resolve this issue.
    c. In order to minimize impacts on the existing framing, the JWF-750 units should be located with the center point of the unit centered on the W24 girders and at mid distance between W16 beams as this will spread the load most evenly between W16 beams and transfer load more directly to the W24 girders, as shown below.

    d. Note: The preliminary equipment load diagram provided for this review indicates units to be centered over columns, which is generally a good approach. However, depending on specific support and anchorage conditions for the JWF-750, this proposed orientation may locate the support and anchorage locations at mid slab span. This can be reviewed once support and anchorage conditions are known, but shifting the units half of a beam spacing (6'-6") may reduce demands on slab and minimize impacts to existing framing.
    e. Columns and Foundations: The load to columns (and therefore foundations) is less than the loading shown on the loading diagram due to the uniform distribution of and wide spacing between the JWF-750 units.
3. The roof plan indicates that there will be 26 of the JWF-750 units totaling a weight of 780 kips. This value is less than the total mechanical load at the roof which is noted on the base building loading diagrams. Additionally the units are shown to be evenly distributed across the building footprint. Therefore, no further review of the lateral system is required.

3. CIVIL SITE WORK & LANDSCAPE



OVERVIEW

This scope* of work includes making adjustments to exterior areas to accommodate new entries and code-required site amenities.

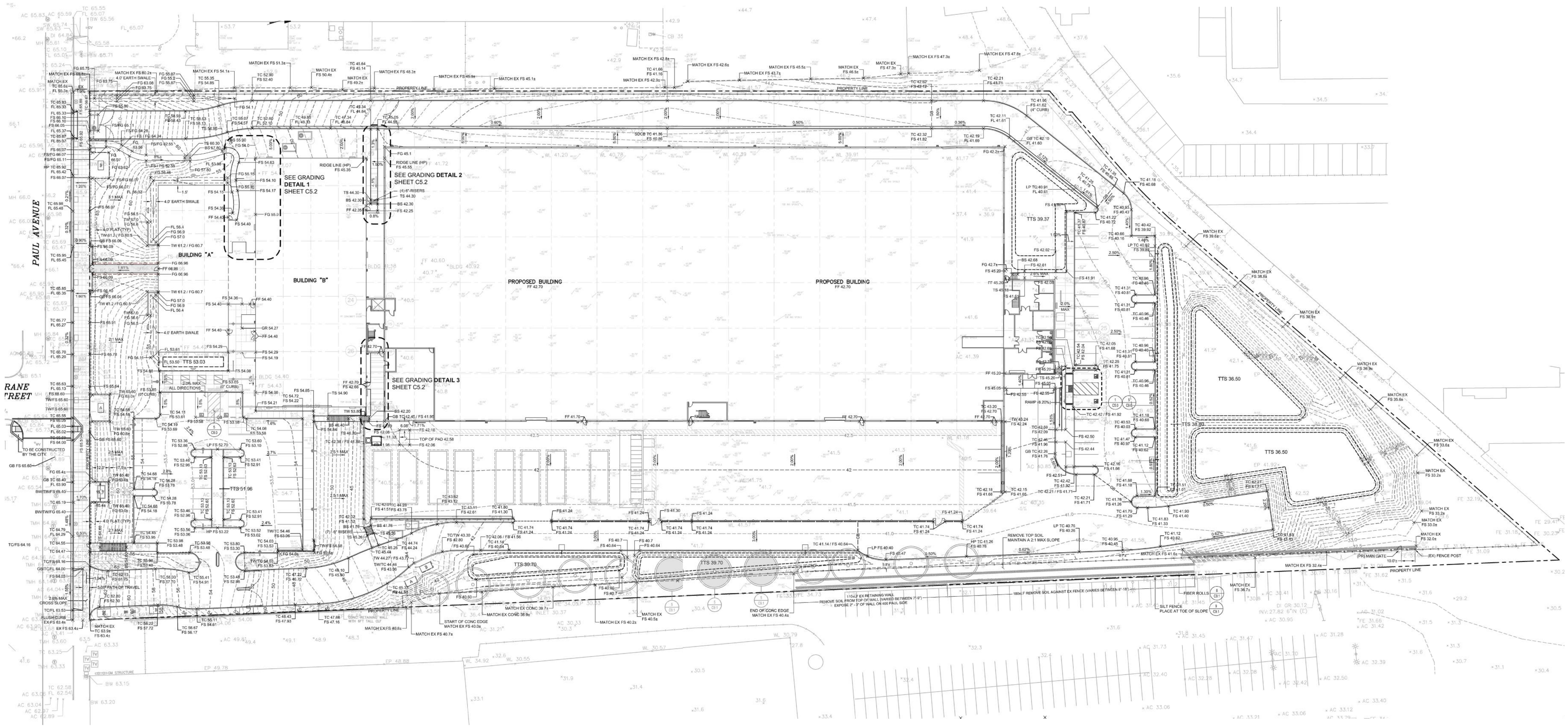
**Note: at this time, not all exterior scope has been established.*

BUILDING A

1. Code-required bike lockers
2. Handrails and guardrails at exterior stairs and retaining walls

BUILDING C

1. Create new canopy at main entrance
2. Install code-required bike lockers
3. Relocate HC parking stalls near new front door
4. Build ADA compliant ramp to the main entrance from the parking lot (tie-in to the existing landing of Building C Stair 3)
5. Relocate two parking spaces from gen yard to original location when property line issue is resolved


PAUL AVENUE
BUILDING "A"
BUILDING "B"
PROPOSED BUILDING
FF 42.70
PROPOSED BUILDING
FF 42.70
SEE GRADING DETAIL 1
SHEET C5.2
SEE GRADING DETAIL 2
SHEET C5.2
SEE GRADING DETAIL 3
SHEET C5.2
TTS 36.50
TTS 36.50
PROPERTY LINE

BUILDING A/B

A. HVAC

1. Variable Refrigerant Volume (VRV) heating and cooling system with makeup air ventilation unit to serve all Phase 1 tenant finish areas, suitable for future tenant fit-outs.
    a. Daikin VRV IV model REYQ outdoor heat recovery units
        i. Simultaneous heating and cooling from one system
        ii. Grade mounted between Building A and B (~grids 10-11 west side)
    b. Daiken FXMQ ducted concealed ceiling fan coil units
    c. 3-pipe refrigerant piping and branch selector boxes for switching
    d. Existing makeup air unit (MAU-B-1) on Building B roof. Rupp Air SA, 11,000 CFM, 1" esp., 100% filtered outside air, no heat. Ducted from roof down to basement and stubbed-out of shaft on each floor with fire/smoke damper. Ventilation air to be ducted directly to each fan coil units return plenum. Ventilation air for Building A fan coils to cross at each floor's connector bridge.
    e. Building A's redwood timber structure will be exposed with no ceilings planned. Ductwork will be exposed, and visual aesthetics will be considered.
2. Elevator equipment room located in basement of Building B: conditioned with existing split system 5-ton Hitachi heat pump. Indoor fan coil unit with an outdoor unit located on grade between Buildings A and B.
3. Existing exhaust fan EF-B-1 on Building B roof. Penn Berry model DX30B, 11,000 CFM, 5 HP motor. Serves as building relief and bathroom exhaust.

B. PLUMBING

1. Building B is served by an existing 2-1/2" domestic cold water line entering on the East side of the basement.
2. Existing duplex domestic water booster pump skid located in Level 1 Domestic Water Pump room B135. Goulds Aquaforce e-MT V2VDC, dual 5 HP pumps, 120 GPM, 53 PSI boost.
3. Existing electric water heater, expansion tank, and recirculation pump located on Basement Level in Janitors closet adjacent to core restrooms. State Industries model CSB-82-6, 6 KW, 80 gal. storage.
4. Plumbing (DCW, DHW, W, V) is roughed into each of the three (3) core restroom groups of Building B (basement, Level 1, Level 2).
5. Phase 1:
    a. Fixtures and fixture rough-ins for Building B Level 1 core restroom group.
6. Fixture type:
    a. WC-1: American Standard Afwall Millennium 2257.101 wall mounted flushometer toilet, 1.28GPF w/ American Standard Ultima 6147SM121.002 sensor operated flushometer and Bemis commercial heavy-duty plastic toilet seat
    b. UR-1: American Standard Pintbrook 0.125GPF high efficiency urinal w/ American Standard Ultima 6145SM013.002 sensor operated flushometer.
    c. L-1: American Standard Ovalyn undercounter sink 0496.221, unglazed rim w/ American Standard Nextgen Selectronic 7755.205 hand washing faucet with above deck mixing.
    d. L-2: American Standard Lucerne 0355.012 wall-hung lavatory w/ American Standard Nextgen Selectronic 7755.205 hand washing faucet with above deck mixing and 4" deck plate.DF-1: ELKAY EDFP217C. Wall mounted bi-level fountain, non-filtered, non-refrigerated, stainless finish
    e. MS-1: Florestone MSR-2424. 24" x 24" floor mounted

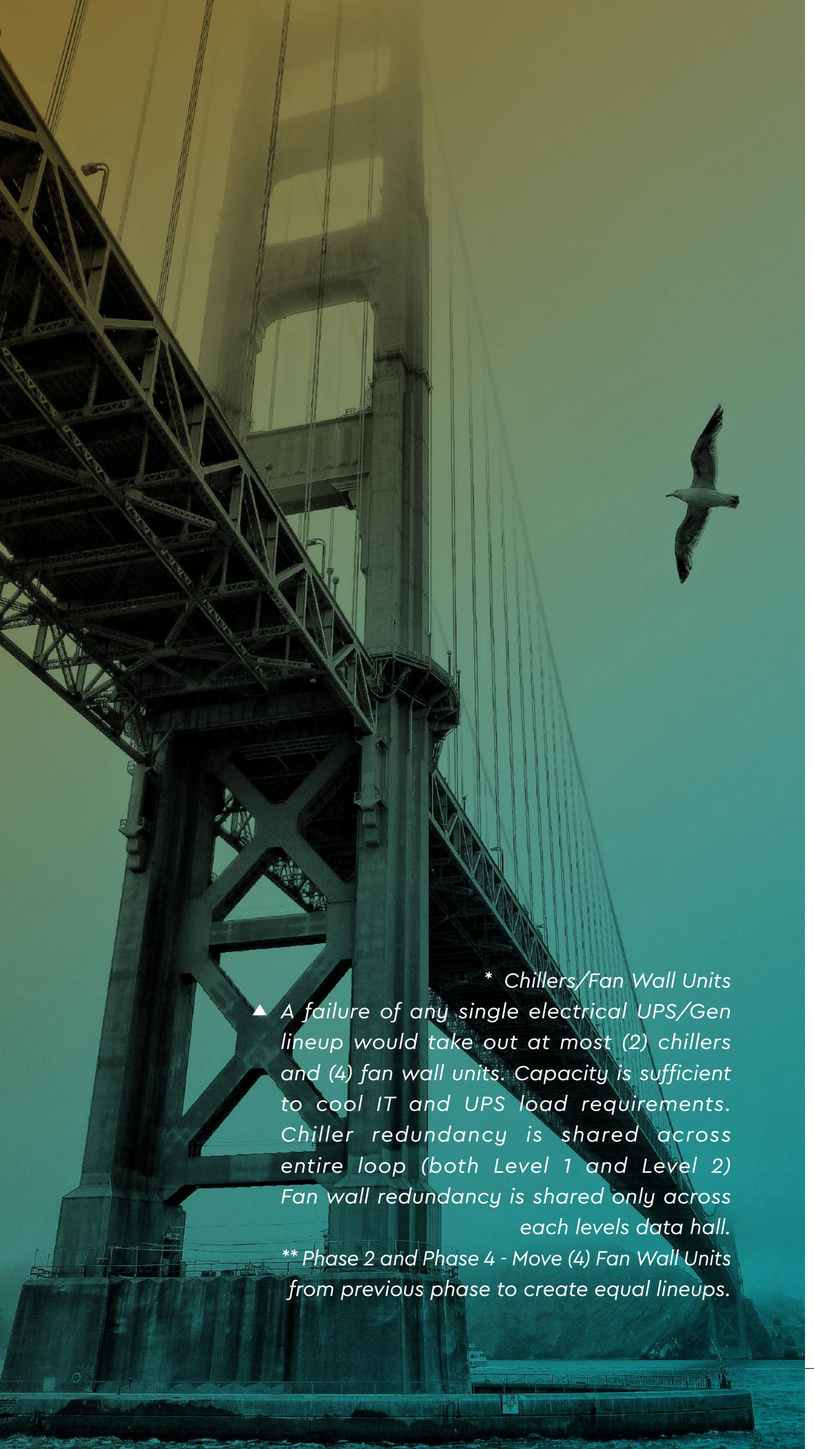
C. FIRE SUPPRESSION

1. Buildings A and B are served by an existing 8" fire sprinkler water line entering the sprinkler pump room B134 of Building B on Level 1.
2. Existing 75 HP booster fire pump
3. Existing wet sprinkler system throughout both Buildings A and B.
4. Phase 1:
    a. Branch piping and/or heads to be modified as necessary to accommodate Phase 1 tenant fit-out. Provide new concealed type sprinkler heads in drop ceilings and pendant type sprinkler heads in exposed spaces.

BUILDING C

A HVAC

1. Mission Critical Spaces — Data Halls and UPS Room
    a. The base cooling system consists of air-cooled chilled water heat rejection units with water side economizer with remote indoor chilled water fan wall units serving white space and downflow chilled water CRAH units to serve the UPS room.
    b. Air cooled chillers
        i. Manufacturer: BASX Solutions
        ii. Model: JWF-750-HE. 750KW nominal cooling capacity
        iii. Variable primary pump: Taco KV 3007D vertical inline pump, 342 GPM at 165 FT HD, integral to chiller by manufacturer
        iv. Air separator, expansion tank, minimum flow bypass piping and three-way control valve integral to chiller by manufacturer and pre-piped
        v. 100% water side free cooling to 60°F ambient temperature
        vi. Scroll compressors
        vii. EC condenser fans
        viii. Factory programmed controller
        ix. 15°ΔT. 70°F LWT - 85°EWT
    c. Chilled water fan wall units (Data Hall)
        i. Manufacturer: BASX Solutions
        ii. FCW-350. 350 KW nominal cooling capacity
        iii. EC supply fans
        iv. 25°F ΔT. 75°F SAT, 100°F RAT
        v. 15°ΔT. 70°F EWT - 85°LWT
        vi. 158 GPM
    d. Chilled water CRAH units (UPS Room)
        i. Manufacturer: BASX Solutions
        ii. CRAH-250, self-contained, water cooled, 250 KW nominal cooling capacity
        iii. EC supply fans
        iv. Downflow supply, top return
        v. 20°F ΔT. 60°F SAT, 80°F RAT
        vi. 15°ΔT. 70°F EWT - 85°LWT
            - Building's chilled water loop will be used as condenser water for these self-contained units
    e. Chilled water CRAH units (MMR Rooms)
        i. Manufacturer: BASX Solutions
        ii. CRAH-150. 150 KW nominal cooling capacity
        iii. EC supply fans
        iv. Downflow supply, top return
        v. 25°F ΔT. 75°F SAT, 100°F RAT
        vi. 15°ΔT. 70°F EWT - 85°LWT



f. Equipment Phasing & Redundancy

	LEVEL 1 DATA HALL		LEVEL 2 DATA HALL		
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**	Total (Full Build-out)
Air Cooled Chillers	Qty 8	Qty 8	Qty 6	Qty 4	Qty 26
Chiller Cooling Capacity	6000 KW	6000 KW	4500 KW	3000 KW	19500 KW
Indoor Fan Wall Units	Qty 16	Qty 8	Qty 16	Qty 8	Qty 48
Data Hall Cooling Capacity	5600 KW	2800 KW	5600 KW	2800 KW	16800 KW
Downflow CRAH Units	Qty 4	Qty 4	0	0	Qty 8
UPS Room Cooling Capacity	1000 KW	1000 KW	0	0	2000 KW
Data Hall IT Load	3600 KW	3600 KW	3750 KW	3750 KW	14700 KW
UPS Room Load	360 KW	360 KW	375 KW	375 KW	1470 KW
System Redundancy* *Post Phase 1 Completion*	N+2 / N+4	-	-	-	-
System Redundancy* *Post Phase 2 Completion*		N+2 / N+3**	-	-	-
System Redundancy* *Post Phase 3 Completion*			N+2 / N+3 (Level 1) N+4 (Level 2)	-	-
System Redundancy* *Post Phase 4 Completion*				N+2 / N+3 (Level 1) N+3 (Level 2)**	▲

** Chillers/Fan Wall Units*

▲ A failure of any single electrical UPS/Gen lineup would take out at most (2) chillers and (4) fan wall units. Capacity is sufficient to cool IT and UPS load requirements. Chiller redundancy is shared across entire loop (both Level 1 and Level 2) Fan wall redundancy is shared only across each levels data hall.

*** Phase 2 and Phase 4 - Move (4) Fan Wall Units from previous phase to create equal lineups.*

g. Chilled water distribution
    i. A dual redundant concurrently maintainable pipe loop will distribute chilled water to each fan wall and CRAH. A 10" main pipe loop will circle both mechanical galleys on the east and west sides of the data halls, on both Level 1 and Level 2, and be interconnected between Level 1 and Level 2 to take advantage of chiller redundancy.
    ii. Each chiller will serve into both pipe loops at strategic locations around the chilled water loop
    iii. Each fan wall and CRAH will be served by both pipe loops. Supply and return pipes from each loop with tie together before a single connection to the unit
    iv. Sectionalizing shut-off valves will be placed between every take-off around the pipe loop
    v. All piping to be heat fusioned Aquatherm Blue Pipe SDR 17.6 MF RP. Prefabricated by Aquatherm and shipped to site for contractor installation.
    vi. Distribution loop piping to be built out along with the building phasing. Cross connections completing the loop along with valved and capped ends ready for future extensions of the system will be provided at the end of each phase.

h. Condensate from the chilled water coils will be collected and pumped to an approved discharge location. No floor drains are present in the data hall or mechanical galley spaces.

i. The data hall racks will have full hot aisle containment with hot return air exiting into the ceiling plenum and returning overhead to the mechanical galleys. The raised access floor is not intended to be used for supply air in data hall. Level 2 is not currently visioned to have a raised access floor.

j. A mechanical galley will line both sides of each data hall. The galley will house the chilled water piping and provide 5' clearance for the data hall return air to pass over the fan walls units to the inlet side of the fans.

k. New makeup air unit to be provided for Data Hall and UPS room ventilation and located on building C roof. Code minimum ventilation rate of 5CFM/person and 0.06 CFM/sf. Rupp Air SA, 6,000 CFM, 1.5" esp., 100% filtered outside air, no heat. Ventilation air to be supplied into the mechanical galleys (for distribution into the data halls) and into the UPS room.

l. Roof penetrations: Comsite Hardware Tessco Qwikport Jr Pipe Vault or AW Mega Vault

m. Humidification to be added by owner at later date should it be deemed necessary.

n. Leak detection will consist of rope type detection covering all areas in white space and electrical rooms where water may be present.

o. The UPS lithium-ion batteries operating temperatures are between 64.4°F – 82.4°F.

p. Air side economization utilizing the planned louvered opening in the East wall of the UPS room will be analyzed for plausibility. The limited temperature window (when not 100% water side economizing and ambient temperature below the battery operating limits) for air side free cooling along with the associated costs of the system may outweigh the benefit. Code minimum requirements for intake distances from the generator exhaust stacks as well as the possibility of bringing in fumes from the generators shall be considered.

2. Ancillary administration spaces
    a. Variable Refrigerant Volume (VRV) heating and cooling system with makeup air ventilation unit
        i. Daikin VRV IV model REYQ outdoor heat recovery units
            - Simultaneous heating and cooling from one system
            - Locate outdoor units on roof
        ii. Daiken FXMQ ducted concealed ceiling fan coil units
        iii. 3-pipe refrigerant piping and branch selector boxes for switching
        iv. Existing makeup air unit (MAU-C-1) on Building C roof. Rupp Air SA, 2,600 CFM, 1.75" esp., 100% filtered outside air, no heat. Ducted from roof down to Level 1. Sized for Level 1 Shipping/Receiving and Level 2 Office areas.
        v. New makeup air unit to be provided for Level 1 Owner Entrance, Security, and Office area ventilation and located on building C roof. Ventilation air to be ducted directly to each fan coil units return plenum. Rupp Air SA, 2,000 CFM, 1" esp., 100% filtered outside air, no heat.
3. Elevator equipment rooms (2) located north and south ends of Level 1: conditioned with existing split system 5-ton Hitachi heat pumps. Indoor fan coil units with outdoor condensers located on the roof.
4. EntroCIM will be used to view and manage the mechanical and electrical equipment from a central software program. EntroCIM will function as both the building automation system (BAS) and the data center infrastructure management system (DCIM).

B PLUMBING

1. Building C is served by an existing 3" domestic cold water line entering on the North side of Level 1 into the Domestic Water Pump Room 161.
2. Existing duplex domestic water booster pump skid located in Level 1 Domestic Water Pump Room 161. Goulds Aquaforce e-MT V2VDC, dual 2 HP pumps, 60 GPM, 48 PSI boost.
3. Existing electric water heater, expansion tank, and recirculation pump located on Level 2 adjacent to Elevator 301. State Industries model CSB-82-6, 6 KW, 80 gal. storage.
4. Plumbing (DCW, DHW, W, V) is roughed in and fixtures set for each of the (3) single occupancy restrooms on Level 1 in Shipping and Receiving. Plumbing extends up to second level and is capped for future restrooms.
5. Phase 1:
    a. Four (4) single occupancy restrooms and breakroom in Owner administration space. Plumbing (DCW, DHW, W, V) including new electric (no natural gas service to the building) water heater. These restrooms are set on raised access flooring. Waste piping to be routed under raised access floor above floor slab and tied into 6" waste line in Fire Pump Room 160. Concrete slab to be cut and waste line to be extended west under the slab.
6. Fixture type to match those of Building A/B

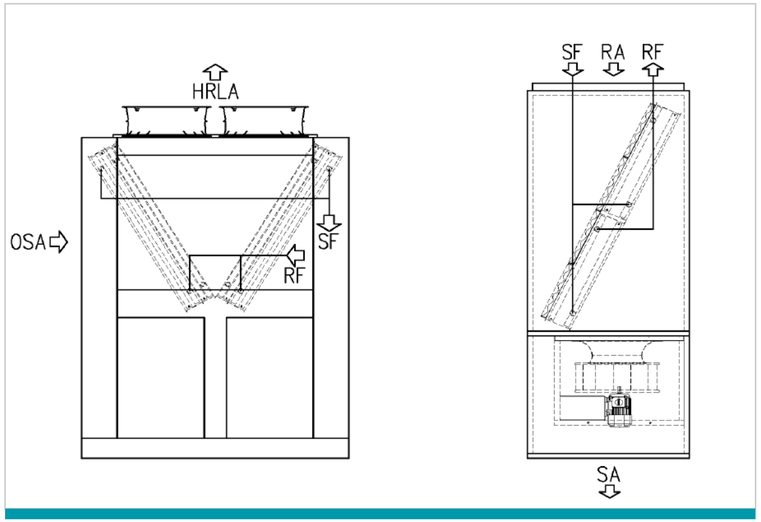
C FIRE SUPPRESSION

1. Building C is served by an existing 8" fire sprinkler water line entering the Fire Pump Room 160 of Building C on Level 1.
2. Existing 75 HP booster fire pump
3. Existing wet sprinkler system throughout Building C. (4) Zones – (2) on Level 1 and (2) on Level 2
4. Phase 1:
    a. Existing Fire Pump Room 160 to be expanded East to accommodate new sprinkler equipment and riser assemblies.
    b. Remove (4) existing wet pipe riser assemblies.
    c. A single new wet sprinkler zone for ancillary administrations spaces (Shipping, Receiving, Offices) located on the north side of the building both Level 1 and Level 2. Branch piping and/or heads to be modified as necessary to accommodate Phase 1 tenant fit-out. New concealed type sprinkler heads in drop ceilings, upright pendant type sprinkler heads in exposed structure spaces to be provided.
    d. New double interlock pre-action zones and zone valve assemblies. Number of zones to be determined based on response time. Pre-action zones to cover all data hall white space on both Levels and UPS/Electrical rooms.
        i. Air compressor
        ii. Nitrogen generator
        iii. Response times to be reviewed. A second pre-action valve room may be required at the South end of Building C.
        iv. Branch piping and/or heads to be modified as necessary to accommodate Phase 1 fit-out.
5. Early warning smoke detections (VESDA) to be provided, sampling both above dropped ceiling and below raised access floor on Level 1.

D SITE

1. Water detection and sump pumps to be provided at (2) carrier entrance vaults located near Paul Avenue, discharging into landscaping or water retention pond.

EQUIPMENT– JWF HEAT REJECTION MODULE WITH REMOTE PROCESS COOLING SYSTEM



MODELED SYSTEM PERFORMANCE

Operating Mode	Critical	Normal	
Total Power Input	1277.8	1269.0	KW
Peak Load PUE	1.284	1.282	KW/KW
Annualized PUE	1.061	1.051	KW/KW
Mechanical Cooling Hours per Year	0.0%	0%	
Partial Free Cooling Hours per Year	22%	22%	
100% Free Cooling Hours per Year	78%	78%	
Operating Mode	Critical	Normal	
JWF Unit Quantity	6	8	
CRAH Unit Quantity	N/A	N/A	

SYSTEM DESIGN INPUTS

TMY3 Weather Data Location	SFO, CA	
Elevation	6	ft
ASHRAE Extreme Design Temp	99	°F DB
Data Vault IT Load	4500	KW
Process Cooling Type	Mixed FCW/CRAH	
Process Supply Air Temp	75	°F DB
Process Air ΔT	25	°F
Fluid Type Water	100%	Water
Fluid ΔT	15	°F
Operating Mode	Critical	Normal
JWF Unit Quantity	6	8
CRAH Unit Quantity	N/A	N/A

EXTREME AMBIENT CRITICAL MODE OPERATION

RA	Return Air Temp	100	°F
SA	Supply Air Temp	75	°F
OSA	Outside Air Temp	99	°F
HRLA	Heat Rejection Leaving Air Temp	116.7	°F
SF	Supply Fluid Temp	70.0	°F
RF	Return Fluid Temp	85.0	°F

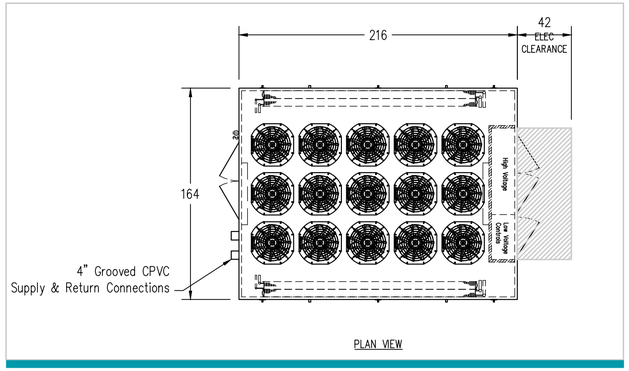
MODELED JWF UNIT PERFORMANCE, JWF-750-HE

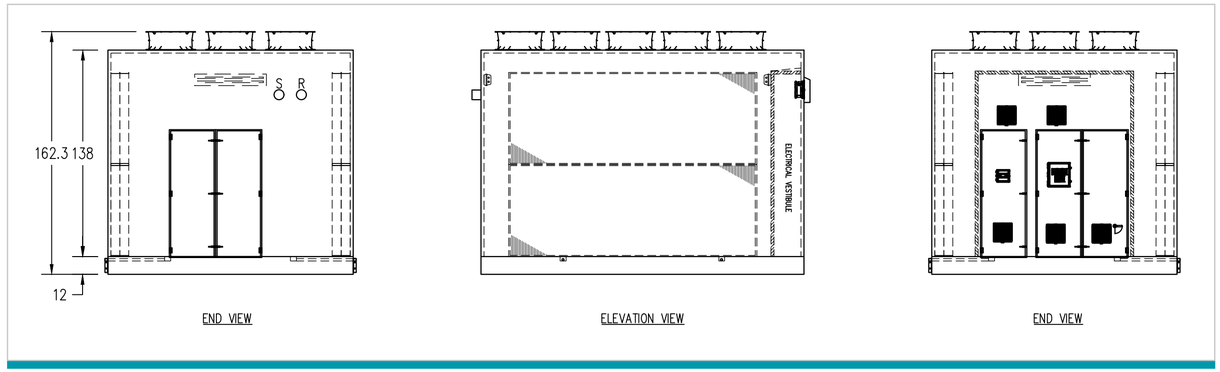
Operating Mode	Critical	Normal	
Net Heat Rejection Capacity	750.0	562.5	KW
Total Power Input	215.5	160.3	KW
Heat Rejection Air Flow Rate	175,526	173,926	ACFM
Heat Rejection Air TSP	0.94	0.94	inwg
Fluid Flow Rate	341	256	GPM
External Fluid Pressure Drop	97	97	ft head
Total Fluid Pressure Drop	155	135	ft head
FLA	358	A	
MCA	375	A	
MOP	440	A	

NORMAL MODE BIN ANALYSIS

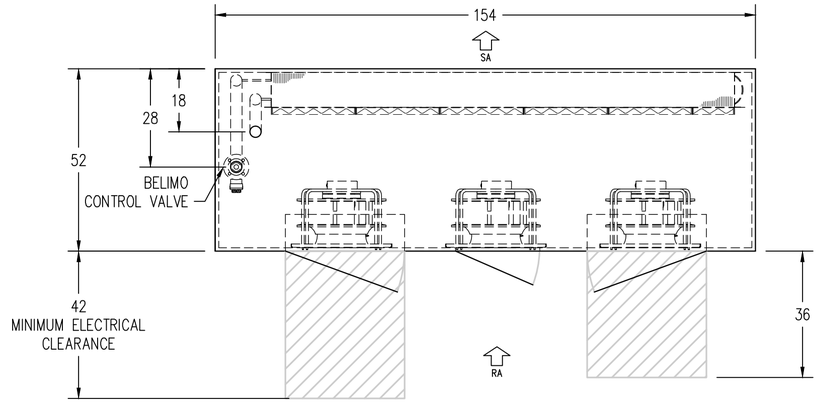
BIN HOURS	ANALYSIS DRY BULB °F	MODE OF OPERATION	HRC EAT °F HRC LAT	HRC LAT °F	HRC LFT °F	HRC HEAT REJECT MBH	HEAT REJ FAN SCFM	HEAT REJ FAN ACFM	HEAT REJ FAN IN.WG.	REQ'D MECH MBH	RECIRC PUMPS KW	HEAT REJ FANS KW	COMP POWER KW	TOTAL POWER KW	TOTAL ENERGY KW-H	PUE
0	99.0	Full DX	99.0	99.0			160,856	173,916	0.94	1,920	84.8	355.9	828.3	1269.0		1.282
3	90.0	Full DX	90.0	90.0			160,856	171,103	0.91	1,920	84.8	340.6	711.2	1136.7	3,410	1.253
25	83.6	Partial FC	83.6	84.3	84.1	119	160,856	169,078	0.90	1,800	84.8	329.8	605.5	1020.2	25,506	1.227
70	78.7	Partial FC	78.7	81.8	80.7	553	160,856	167,440	0.88	1,367	84.8	321.3	434.4	840.5	58,834	1.187
227	72.8	Partial FC	72.8	78.9	76.7	1,067	160,856	165,519	0.86	853	84.8	311.4	259.3	655.6	148,819	1.146
485	68.3	Partial FC	68.3	76.6	73.6	1,461	160,856	164,063	0.85	459	84.8	304.1	145.8	534.7	259,344	1.119
1,105	63.7	Partial FC	63.7	74.4	70.5	1,857	160,856	162,589	0.84	63	84.8	296.8	20.8	402.4	444,661	1.089
2,341	58.7	100% FC	58.7	74.0	70.0	1,920	115,561	116,638	0.48		84.8	121.0		205.9	481,979	1.046
3,041	53.8	100% FC	53.8	74.0	70.0	1,920	87,379	88,194	0.30		84.8	56.9		141.7	431,061	1.031
998	48.9	100% FC	48.9	74.0	70.0	1,920	70,361	71,017	0.21		84.8	31.7		116.6	116,320	1.026
384	44.6	100% FC	44.6	74.0	70.0	1,920	60,115	60,675	0.16		84.8	20.7		105.6	40,541	1.023
80	39.6	100% FC	39.6	74.0	70.0	1,920	51,459	51,939	0.12		84.8	13.6		98.5	7,878	1.022
1	36.0	100% FC	36.0	74.0	70.0	1,920	46,563	46,998	0.10		84.8	10.4		95.2	95	1.021

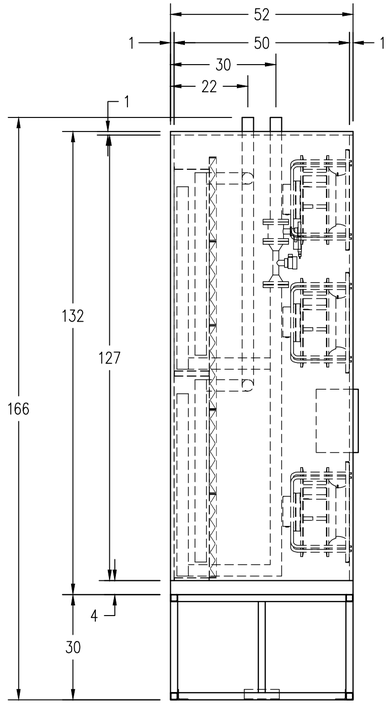
8 of 8 JWF-750-HE | Annualized PUE 1.0512

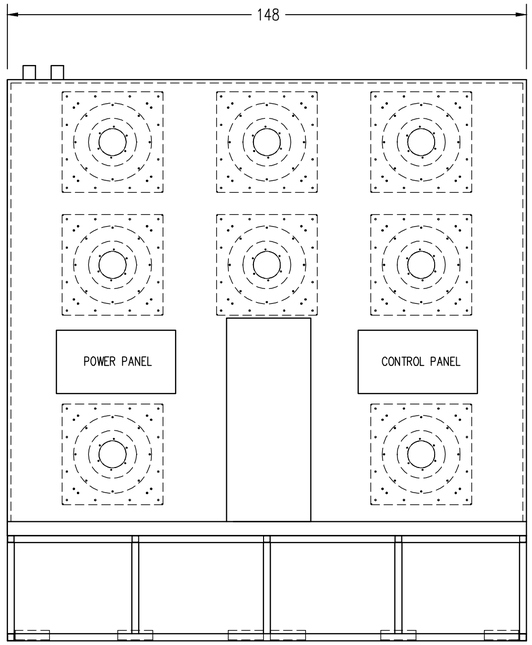




EQUIPMENT– JWF HEAT REJECTION MODULE WITH REMOTE PROCESS COOLING SYSTEM







GENERAL

A. MEDIUM VOLTAGE SERVICE

1. The local Utility (PGE) has provided one 12.47KV, 12MW/15MVA service (Existing).
2. Existing Medium Voltage (MV) Distribution gear for 12 MW.
    a. Modifications are required for existing 12.47 KV service.
    b. Existing distribution gear to feed 12.47KV to 480/277V, 2500KVA pad mount liquid-filled transformers; existing house power system Buildings A/B, C, and new critical load systems 1-6.
    c. Provide 15KV medium voltage feeders to the new critical load transformers from MV distribution gear.
3. A second Utility (PGE) service will be provided as the site load dictates.
    a. 12MW/15MVA service
    b. Additional Medium Voltage Distribution Switchgear will be required for future 12 MW.
        i. New Distribution gear to feed 12.47KV to 480/277V, 2500KVA pad mount liquid-filled transformers and new critical load systems 7-16.
    c. Provide 15KV medium voltage feeders to the new critical load transformers from MV distribution gear.

B. POWER DISTRIBUTION SYSTEM COMMON REQUIREMENTS

1. Branch circuit and feeder conductors shall be installed in raceway with a grounding conductor.
2. Provide a maximum of 3 phase conductors per feeder raceway.
3. Conductors, including system neutrals shall be color coded and labeled at each junction or outlet box.
4. Branch circuits to be provided with separate neutrals for each multi-circuit homerun.
5. Raceway systems to form a continuous grounding system.
6. Label equipment, raceways and wiring devices as described within this document.
7. Provide panelboard circuit directories.
8. Gray devices with stainless steel covers. While-in-use Weather proof (WP) where required.

9. Medium Voltage (15kV) copper MV105 insulated electrical conductors.
    a. Single conductor, 220 EPR insulation (133%)
    b. Low-voltage (600V) copper THWN/THHN insulated electrical conductors and cable.
        i. #12 AWG minimum size.
        ii. Stranded conductors for #8 and larger.
10. Raceways and Boxes for Electrical Systems.
    a. Conduit
        i. Electrical Metallic Tubing (EMT) with steel fittings
        ii. Rigid steel
        iii. Flexible metal conduit
        iv. Liquid-tight flexible conduit
    b. Junction/Outlet boxes (Indoor): Steel construction, minimum 4" square, 2-1/8" deep and sized per National Electrical Code (NEC)
    c. Junction/Outlet boxes (Outdoor): Cast metal construction with threaded hubs and sized per National Electrical Code (NEC)
11. Surge Protective Devices (SPD).
    a. Service Entrance - Peak Surge Current Rating: 240kA.
    b. 200kA SCCR.
    c. Internal Mounting.
    d. Form-C contacts.
    e. Comply with UL 1449.
12. Enclosed Switches.
    a. Non-Fused/Fused Safety Switches.
        i. Heavy Duty and horsepower rated.
        ii. 600VAC.
        iii. Ampere and AIC rating as required.
    b. Enclosure.
        i. NEMA 1 in interior/dry locations.
        ii. NEMA 3R in exterior/damp locations.
13. Enclosed Controllers
    a. Motor Starter Switch (MSS)
        i. General purpose, Class A.
        ii. Horsepower rated.
        iii. Integral thermal overload protection.
        iv. Toggle switch operator.
        v. Locking provisions.
        vi. Red pilot light.
        vii. 10KAIC rating (minimum).
        viii. Hand-Off-Auto (HOA) switch.
    b. Combination Motor Starter / Disconnect.
        i. Factory assembled.
        ii. Separately enclosed.
        iii. Full Voltage Non-Reversing (FVNR).
        iv. Thermal Magnetic Circuit Breaker Type.
        v. Manual push-to-trip button.
        vi. NEMA size as required.
        vii. NEMA enclosure as required.
        viii. Auxiliary contacts.
        ix. 120V heavy duty control transformer.
        x. Overload relays.
        xi. 100KAIC rating (minimum).
        xii. Start-stop momentary pushbutton control.
        xiii. Hand-Off-Auto (HOA) switch.
        xiv. Pilot lights.
        xv. External operating handle capable of padlocking in the OFF position.
        xvi. ON–OFF position indicator.
    c. Enclosure.
        i. NEMA 1 in interior/dry locations.
        ii. NEMA 3R in exterior/damp locations.

14. Variable Frequency Controllers (VFDs)
    a. Provided by Electrical contractor or included with packaged mechanical units
    b. Individually mounted
    c. Input disconnect with fuses and lockable handle
    d. 100kA minimum short circuit rating
    e. Six-pulse full wave diode or PWM bridge
    f. Metal Oxide Varistors (MOVs) for surge protection
    g. BAS Input/Outputs
    h. VFD Power Filters
    i. Enclosure
        i. NEMA 12 in interior locations
        ii. NEMA 3R in exterior/damp locations

15. Poke-Thru Devices
    a. Recessed Device Style
        i. 6" diameter, die-cast aluminum cover assembly
        ii. Two (2) duplex receptacles (minimum); Low voltage system outlet provisions
        iii. 2 hour UL Fire Classification
        iv. Legrand Wiremold Evolution 6AT/8AT series (Basis of Design)
    b. Furniture Feed Style
        i. 3" diameter, Die-cast aluminum cover assembly
        ii. Power feed and low voltage provisions
        iii. 2 hour UL Fire Classification
        iv. Legrand Wiremold RC series (Basis of Design)

16. Wiring Devices
    a. Receptacles
        i. 20 amp Heavy Duty Specification grade
        ii. 20 amp Ground Fault Circuit Interrupter (GFCI) type
        iii. 20 amp Heavy Duty Tamper-Resistant type

C. EXISTING EMERGENCY POWER

1. Existing battery powered life safety loads, match for required changes/additions

D. GROUNDING AND BONDING

1. The existing building grounding and bonding system shall be utilized with required modifications for this project
   b. Connect all grounding electrode system conductors to the Main Ground Busbar located in the Main Electrical room.
   c. Provide Telecommunications Main Ground Bus (TMGB) in first Telecommunications Entrance Facility room (MMR).
   d. Provide Telecommunications Ground Bus (TGB) in second MMR Room.
2. Separately Derived Grounding System.
   a. Provide grounding electrode conductor to nearest Grounding Electrode.
   b. Provide required neutral bonding jumpers.
   c. Ground generator as a separately derived system.
3. Equipment Grounding.
   a. Provide a separate insulated equipment grounding conductor within the same raceway enclosing the circuit conductors.
   b. Do not use building steel as an equipment grounding path.
4. Grounding and Bonding for Electrical Systems.
   a. (600V) copper THWN/THHN insulated electrical conductors and cable.
      i. Continuous green insulation jacket for #6 AWG and smaller.
      ii. Green tape banding for #4 AWG and larger.

E. LIGHTNING PROTECTION SYSTEM

1. The existing building lightning protection system shall be utilized with required modifications for this project.
2. System shall comply with:
   a. NFPA 780, Standard for the Installation of Lightning Protection Systems.
   b. UL 96A, Installation Requirements for Lightning Protection Systems.
3. Installing contractor shall furnish a UL Master Label upon completion of the installation.
4. All materials shall be new and UL listed for use in a lightning protection system.
   a. Class I materials shall be used on structures that do not exceed 75 feet in height.
5. Bond the lightning protection grounding system to the building electrical power system grounding electrode system.

F. LIGHTING

1. Interior Lighting Fixtures (Basis of Design).
    a. Type A: 4"x8' Trimless Linear, LED, Focal Point Seem 4.
    b. Type B7: 2'x4' Centerbasket LED
    c. Type B11: 2'x2' Direct Lensed Volumetric
    d. Type C: Cove Light, Cooledge SP-LLS-07.
    e. Type D: Downlight, 4.5" Aperture, LED, 0-10V Dimming, Focal Point FLC44D.
    f. Type K2: Industrial linear with lens
    g. Type E: LED type Edge-lit.
2. Exterior
    a. Existing
3. Scope of Work for Lighting Systems.
    a. Lighting levels throughout the project shall be in accordance with the recommendations of the Illuminating Engineering Society (IES) or Owner standards.
    b. Provide emergency egress lighting on Life Safety power to comply with the Building Code required lighting levels.
    c. Provide light fixture types as indicated for the following rooms:
        i. Corridors (Type A)
        ii. Open Offices (Type B)
        iii. Private Offices (Type B)
        iv. Conference Rooms (Type A2, Type D)
        v. Toilet (Type D)
        vi. Electrical/Mechanical Rooms (Type K2)
        vii. Data Center (Type B11)

G. LIGHTING CONTROL SYSTEMS

1. Light Switches.
    a. Quiet type toggle switches rated at 20 amp, 277VAC.
2. Dimmers.
    a. Compatible with 0-10V LED driver/power supplies.
    b. Manufacturer: Lutron Nova T-star series (Basis of Design)
3. Occupancy Sensors
    a. Dual Technology type (PIR and Ultrasonic).
    b. Wall or Ceiling mount.
    c. Power pack relays as required.
4. Provide a stand-alone lighting control system as manufactured by Crestron.
    a. Lighting control system shall not to be tied into BAS system.
    b. Provide occupancy sensors with manual overrides in open offices, private offices, small and medium conference rooms, work rooms, break rooms, storage rooms, restrooms and similar areas. These areas to also be controlled via the lighting control system.
    c. Mechanical/electrical/telecom rooms will have local switching.
    d. Use of daylight dimming will be incorporated into all perimeter spaces, controlling the outer 15 feet of lighting.
    e. General lighting will be swept off via lighting control system after hours, with the exception of emergency and night security lighting.

BUILDING A/B

A. NORMAL AND EMERGENCY POWER

1. The existing 480V House Power service entrance for Building A/B will remain
2. The existing Service Entrance 480/277V Switchboard, Distribution Panelboards, and Branch Circuit panelboards will remain and be modified as required to serve power throughout building.
3. The existing emergency power electrical distribution system shall be utilized.
    a. Automatic transfer switches are existing
        i. Legally Required Standby Loads
        ii. Equipment Branch
4. New Branch Circuit Panelboards, Sq D. (Basis of Design)
    a. Quantity of two
    b. Tin Plated Copper bus rated for available short-circuit current
    c. Bolt-on type, molded case, thermal magnetic, trip indicating, circuit breakers
    d. Fully rated circuit breakers for required interrupting rating
    e. Dead front galvanized NEMA 1 steel enclosure with lockable door
    f. Door-in-door hinges.
5. Emergency Power Engine Generator Set (Emergency Standby Rated)
    a. 2000kW, 480/277V Cummins DQKAB (Basis of Design)
    b. Comply with NFPA 110, Level 1 system
    c. EPA Certified for Stationary Emergency Application
    d. Walk-in Type Enclosure
    e. 3600 gallon, 24 hour runtime, sub-base, double wall fuel tank
    f. Engine-mounted Radiator Cooling System
    g. Muffler/Silencer Exhaust System
        i. Meet California emissions code
        ii. Critical Grade, low profile disk Muffler
    h. Sound attenuation to comply with local and state regulations

B. BUILDING AND MECHANICAL EQUIPMENT POWER CONNECTIONS

1. Provide required power connections to (1) 40 HP passenger elevators
2. Provide required power connections to power operated doors
3. Provide required power to support space fit-out areas
4. Provide required connections to the following mechanical equipment
    a. (8) 5 ton Variable Refrigerant Volume (VRV) units
    b. (1) 5 HP exhaust fan
5. Provide 120V, 20 amp dedicated circuits for BAS control panels

BUILDING C

A. NORMAL AND EMERGENCY POWER

1. The existing 480V House Power service entrance for Building C will remain
2. The existing Service Entrance 480/277V Switchboard, Distribution Panelboards, and Branch Circuit panelboards will remain and be modified as required to serve power throughout building.
3. The existing emergency power electrical distribution system shall be utilized.
    a. Automatic transfer switches are existing
        i. Legally Required Standby Loads
        ii. Equipment Branch
4. New Branch Circuit Panelboards, Sq D. (Basis of Design)
    a. Quantity of two
    b. Tin Plated Copper bus rated for available short-circuit current
    c. Bolt-on type, molded case, thermal magnetic, trip indicating, circuit breakers
    d. Fully rated circuit breakers for required interrupting rating
    e. Dead front galvanized NEMA 1 steel enclosure with lockable door
    f. Door-in-door hinges
5. Emergency Power Engine Generator Set (Shares Building A/B generator)

B. BUILDING AND MECHANICAL EQUIPMENT POWER CONNECTIONS

1. Provide required power connections to loading dock equipment (power doors, dock levelers, dock locks, etc.)
2. Provide required power connections to power operated doors
3. Provide required power to support space fit-out areas
4. Provide required connections to the following mechanical equipment
    a. (4) 5 ton Variable Refrigerant Volume (VRV) units
    b. (1) 5 HP exhaust fan
5. Provide 120V, 20 amp dedicated circuits for BAS control panels

C CRITICAL LOAD POWER

1. From existing MV Distribution Gear
    a. Sq D./Schneider (Basis of Design)
    b. Phase 1 – 12MW
        i. (4) 12.47KV feeders
    c. Master Plan Final – 24MW
        i. (16) 12.47KV feeders
2. Transformers
    a. Phase 1
        i. (4) 2500KVA Transformers
    b. Master Plan Final
        i. (16) 2500KVA Transformers
3. Engine Generator Set
    a. 2000kW, 480/277V Cummins DQKAB (Basis of Design)
    b. Mission Critical Standby rated
    c. Comply with NFPA 110, Level 1 system
    d. EPA Certified for Stationary Emergency Application
    e. Walk-in Type Enclosure
    f. 3600 gallon, sub-base, double wall, diesel fuel tank
    g. Engine-mounted Radiator Cooling System
    h. Muffler/Silencer Exhaust System
        i. Critical Grade, low profile disk Muffler
        ii. Meet California emissions code
    i. Sound attenuation to comply with local and state regulations
    j. Phase 1
        i. (4) 2000KW/2500KVA Generators
    k. Master Plan Final
        i. (16) 2000KW/2500KVA Generators
4. Low-Voltage Critical Switchgear: Rated 600V and 3000A
    a. Quality Electrical Systems (Basis of Design)
    b. Outdoor
        i. NEMA 3R Non-Walk-in, metal enclosed structure, compartmentalized units with steel barriers
    c. Indoor
        i. NEMA 1, metal enclosed structure, compartmentalized units with steel barriers
    d. Draw-out Low-voltage power circuit breakers
        i. Utility-Generator breaker pair transfer with required close transition controls
        ii. Stored-energy mechanism
        iii. Electrically operated
        iv. Solid-state microprocessor based trip units.
            - L – Long time delay
            - S – Short time delay
            - I – Instantaneous trip
            - G – Ground fault protection
        v. Arc Flash (Energy) Reduction Maintenance Switch
        vi. Remote Racking Device
    e. Front access only, dead front type
    f. Fully rated tin plated copper bus, rated for available short-circuit current
    g. Ground bus to run entire length of switchgear
    h. Surge Protection Device (SPD)
    i. Infrared Windows
    j. Key Interlocks
    k. Mimic Bus
    l. Owner Metering/Monitoring:
        i. Main Metering/Monitoring
            - Microprocessor based unit with digital display
            - Metering current transformers
            - Power Quality metering: Harmonic distortion, Waveform capture, Trip log, and Power metering
            - Power and Energy metering: Voltage, Current, Kilowatts, Kilowatt-Hours, and Power Factor
        ii. Feeder Metering/Monitoring

- Microprocessor based unit with digital display
- Metering current transformers
- Power Quality metering: Harmonic distortion, Waveform capture, Trip log, and Power metering
- Power and Energy metering: Voltage, Current, Kilowatts, Kilowatt-Hours, and Power Factor
- Trip Unit metering

iii. System Communications interface components to communicate to Building Automation System

iv. Phase 1
- (4) Switchgear Line-ups

v. Master Plan Final
- (16) Switchgear Line-ups

5. Critical Interruptible Power Supplies (UPS)
   a. Schneider Galaxy VX (Basis of Design)
   b. Lithium Ion Batteries (9 min 30 sec runtime)
      i. Samsung LIBSMG95GUL, UL9540A Listed (Basis of Design)
   c. (3 of 4) System redundancy
   d. Wrap-around Maintenance Bypass
   e. Phase 1
      i. (4) 1500KVA modules
   f. Master Plan Final
      i. (16) 1500KVA modules
6. Power Distribution Units (PDU)
   a. PDI/Eaton 300KVA (Basis of Design)
   b. Phase 1
      i. (5) PDUs per UPS lineup, total of (20)
         - 16 – 450A distribution breakers per PDU
   c. Master Plan Final
      i. (5) PDUs per UPS lineup, total of (80)
         - 6 – 450A distribution breakers per PDU
7. Critical Mechanical Equipment power connections
   a. 480V, 3 phase, single point, power connections
   b. Phase 1
      i. (1) 5HP Pre-action air compressor
      ii. (4) Computer room air handling units
      iii. (8) 215 ton air cooled chillers
         - Integral chilled water pumps
      iv. (16) Fan Walls
      v. 120V, 20 amp dedicated circuits for BAS control panels.
   c. Master Plan Final
      i. (1) 5HP Pre-action air compressor
      ii. (8) Computer room air handling units
      iii. (26) 215 ton air cooled chillers
         - Integral chilled water pumps
      iv. (48) Fan Walls
      v. 120V, 20 amp dedicated circuits for BAS control panels

ELECTRICAL SYSTEM LOADS – NORMAL OPERATION

	PHASE 1				PHASE 2				PHASE 3				PHASE 4				
	SYSTEM 1	SYSTEM 2	SYSTEM 3	SYSTEM 4	SYSTEM 5	SYSTEM 6	SYSTEM 7	SYSTEM 8	SYSTEM 9	SYSTEM 10	SYSTEM 11	SYSTEM 12	SYSTEM 13	SYSTEM 14	SYSTEM 15	SYSTEM 16	BLDG C MW
Utility KW	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	24 Utility
Generator KW	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	32 Generator
UPS RM Cooling KW	13	13	13	13	13	13	13	13	0	0	0	0	0	0	0	0	
UPS KW	900	900	900	900	900	900	900	900	937.5	937.5	937.5	937.5	937.5	937.5	937.5	937.5	
Battery Charge and InEff in KW	90	90	90	90	90	90	90	90	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	
Cooling KW	357	357	357	357	357	357	357	357	357	236	357	236	236	236	236	236	
Phase IT Load MW	3.60				3.60				3.75				3.75				14.70 Total MW IT Load

	HOUSE/LIFE SAFETY (A,B,C)	
	SYSTEM 17	SYSTEM 18
Utility KW	0	0
Generator KW	2000	2000
Lighting KW	245	
Receptacles	200	
House Mech	630	
Misc	100	
ELV/LS/Fire Pumps	390	
Total System Load	1565	

ELECTRICAL SYSTEM LOADS – CRITICAL OPERATION (1 SYSTEM FAILURE PER FLOOR)

	PHASE 1				PHASE 2				PHASE 3				PHASE 4				
	SYSTEM 1	SYSTEM 2	SYSTEM 3	SYSTEM 4	SYSTEM 5	SYSTEM 6	SYSTEM 7	SYSTEM 8	SYSTEM 9	SYSTEM 10	SYSTEM 11	SYSTEM 12	SYSTEM 13	SYSTEM 14	SYSTEM 15	SYSTEM 16	BLDG C MW
Utility KW	2000	2000	2000	0	1500	1500	1500	1500	2000	2000	2000		1500	1500	1500	1500	24 Utility
Generator KW	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	32 Generator
UPS RM Cooling KW	13	13	13	0	13	13	13	13	0	0	0	0	0	0	0	0	
UPS KW	1200	1200	1200		900	900	900	900	1250	1250	1250		937.5	937.5	937.5	937.5	
Battery Charge and	120	120	120	0	90	90	90	90	125	125	125	0	93.75	93.75	93.75	93.75	
Cooling KW	468	468	468	0	357	357	357	357	468	270	468	0	197	197	197	197	Removed 1 system per floor
Phase IT Load MW	3.60				3.60				3.75				3.75				14.70 Total MW IT Load

	HOUSE/LIFE SAFETY (A,B,C)	
	SYSTEM 17	SYSTEM 18
Utility KW	0	0
Generator KW	2000	2000
Lighting KW	245	
Receptacles	200	
House Mech	630	
Misc	100	
ELV/LS/Fire Pumps	390	
Total System Load	1565	

D. PATHWAYS FOR COMMUNICATION SYSTEMS

1. Backbone Pathways
   a. Continuous Raceway required and shall consist of 4" conduit
      i. Install ABF Innerduct in Continuous Raceways
      ii. Dura-line MicroDuct HDPE (www.duraline.com)
      iii. 22/16 size (15.4mm ID)
   b. Horizontal Pathways
      i. Continuous raceway required in exposed areas and shall be a minimum of ¾" conduit. Where exposed, painted to match existing conditions
      ii. Many areas are visible / exposed (historic buildings), so most project areas will require full raceway
2. Cable Tray
   a. Building Corridors and Links: Provide 18" wide x 4" deep wire mesh type
   b. Data Center and Telecommunications Rooms: Provide 18" wide x 4" deep wire mesh type, routed around room perimeter and above cabinets
3. Junction / Outlet Boxes
   a. Minimum 4" square, 2-1/8" deep with required mud ring

E. GROUNDING FOR COMMUNICATION SYSTEMS

1. Provide full communications grounding system throughout all buildings
   a. Conform with TIA 607 Standard
   b. Incorporate telecommunications main grounding bus (TMGB), telecommunications grounding busbars (TGB), and telecommunications grounding backbone (TBB) throughout all buildings
2. Permanently bond all metallic cabinets, pathways, and cable tray elements to communications grounding system

F. VOICE / DATA SYSTEMS

1. Telecommunications Rooms (TR)
   a. Quantity, design, and layout per TIA and BICSI Standards
   b. Will contain intermediate distribution frames (IDF) for 3 buildings.
2. Entrance Facilities (EF), located in Building C.
   a. Building C includes two (2) redundant EF rooms, called Meet Me Rooms (MMR)
   b. Redundant MMRs will be at physically disparate locations for full route diversity
   c. Each MMR will be served by separate buried service routes for redundant ISP services
   d. MMR design and layout will be per TIA and BICSI Standards
   e. MMRs will contain site main distribution frames (MDF)
3. Backbone Cable / Connectivity
   a. SM Fiber
      i. Corning Brand
      ii. Air-blown Fiber (ABF) Type
      iii. LC connector terminations
   b. Backbone cables will connect each IDF to MDF
      i. For each IDF, provide two (2) diverse path backbone connections to MDF
      ii. For Building A, backbones will route through A-B connector
         • Provide expansion fittings, to support expansion joint at A-B connector
4. Horizontal Cable / Connectivity
   a. Category 6 Copper
      i. No specific manufacturer
      ii. Plenum-rated
      iii. 1 Gb+ performance
      iv. Cable / connectivity performance warranty and installation certification

b. Horizontal cables will connect each communications outlet to IDF
    i. Communications outlets will be provided for all workstation locations, wireless access point locations, IP phone set locations, IP surveillance camera locations, and any other IP device locations.

G. PUBLIC ADDRESS SYSTEMS

1. No public address systems planned for the site

H. BUILDING SPEECH PRIVACY SYSTEMS

1. No Speech Privacy (aound masking) Systems planned for the site

I. AUDIO VISUAL (AV) SYSTEMS

1. Three (3) conference rooms will include local AV systems
    a. Each room shall incorporate full AV conferencing capability
    b. Each room shall incorporate Crestron touch screen control for AV systems
    c. Provide manual and automatic interfaces to building lighting control systems
    d. Each room shall include Crestron Room Availability system

J MASTER ANTENNA / CABLE TV SYSTEM

1. Provide a J-box with 3/4" conduit to the cable tray system

K. PATHWAYS FOR ELECTRONIC SAFETY & SECURITY SYSTEMS

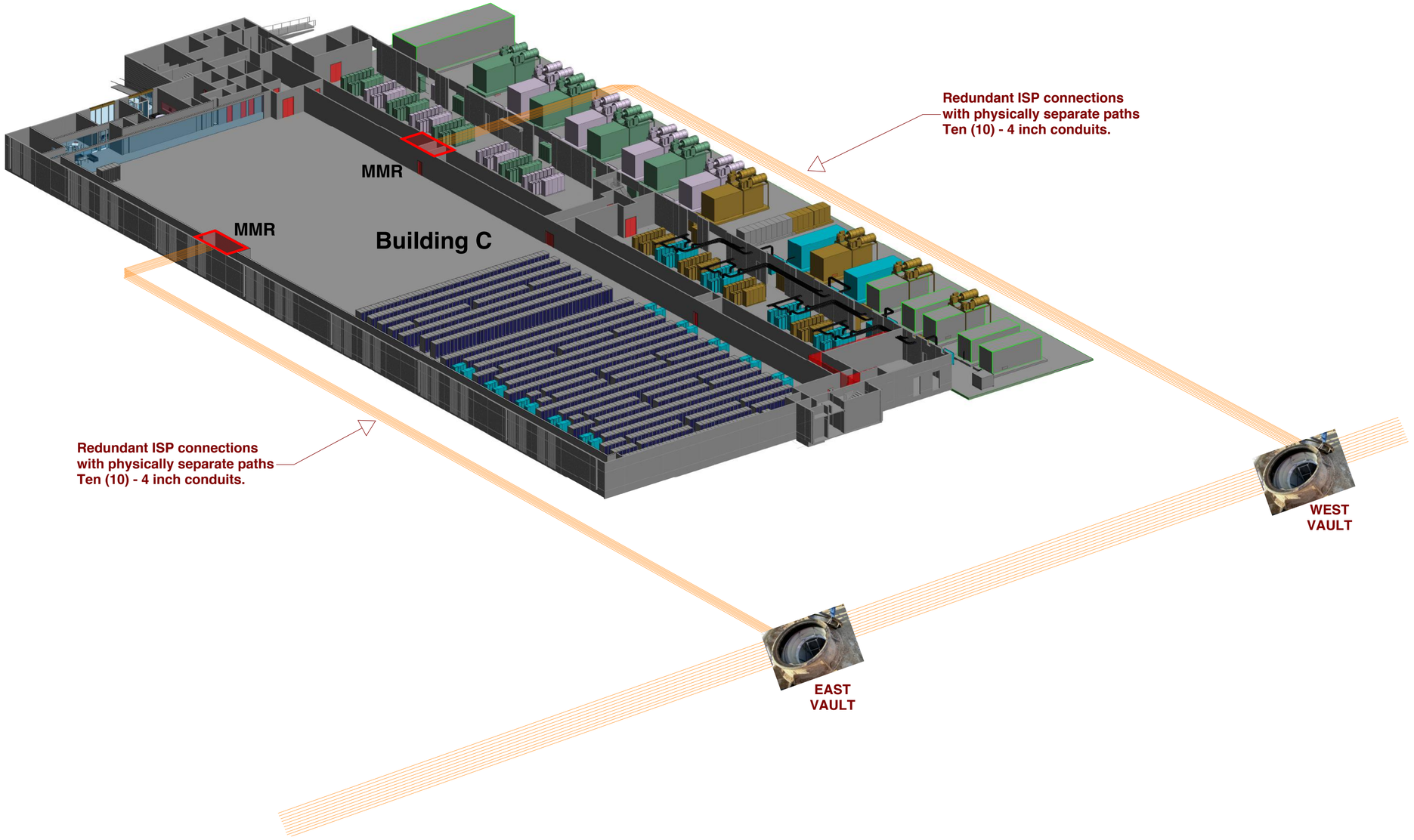
1. Horizontal Pathways
    a. Continuous raceway required in exposed areas and shall be a minimum of ¾" conduit. Where exposed, painted to match existing conditions
    b. Many areas are visible / exposed (historic buildings), so most project areas will require full raceway
    c. Where routed through building links, provide expansion fittings to support expansion joint at A-B connector
    d. Conduit must be rated for the intended use
2. Junction/Outlet Boxes
    a. Minimum 4" square, 2-1/8" deep with required mud ring. Provide flush mounted extension rings for voice evacuation style notification appliances.

L. FIRE ALARM SYSTEM

1. Revise and extend fire alarm systems and equipment for complete, code-compliant protection of all updated interior spaces
    a. Provide Radio Frequency (RF) reinforcement system to support Firefighter and Emergency Responder radio operation throughout the buildings, in accordance with local ordinance requirements
    b. Provide addressable monitoring of RF reinforcement system for system fault condition and system power interruption
2. Provide a Total (Complete) Coverage smoke detector system throughout the renovated department
3. Provide new notification devices throughout all renovated/ new constructed areas
    a. Provide required distributed voice evacuation amplifiers and manual controls to support all added devices, plus 25% spare capacity (in watts)
    b. Provide required power supplies to support all added devices, plus 25% spare capacity (in amps)
4. Provide redundant, Class X connections to any new intelligent distributed fire alarm control panels (FACP)
5. Provide Class B connections to distributed devices
6. Initiating Devices
    a. Intelligent and addressable
        i. Photoelectric smoke sensors
        ii. Manual pull stations
        iii. Duct smoke detectors
        iv. Monitor / Control Modules
        v. Provide manual / automatic control and monitoring interfaces to local fire protection systems
            - Preaction suppression systems
            - Early Warning Smoke detection system
7. Notification Devices
    a. Ceiling and wall mounted audible voice evacuation speakers and visual strobes (selectable candela)
    b. NAC Power Supplies
8. Provide connections to the DCIM system for fully addressable monitoring of Fire Alarm system status

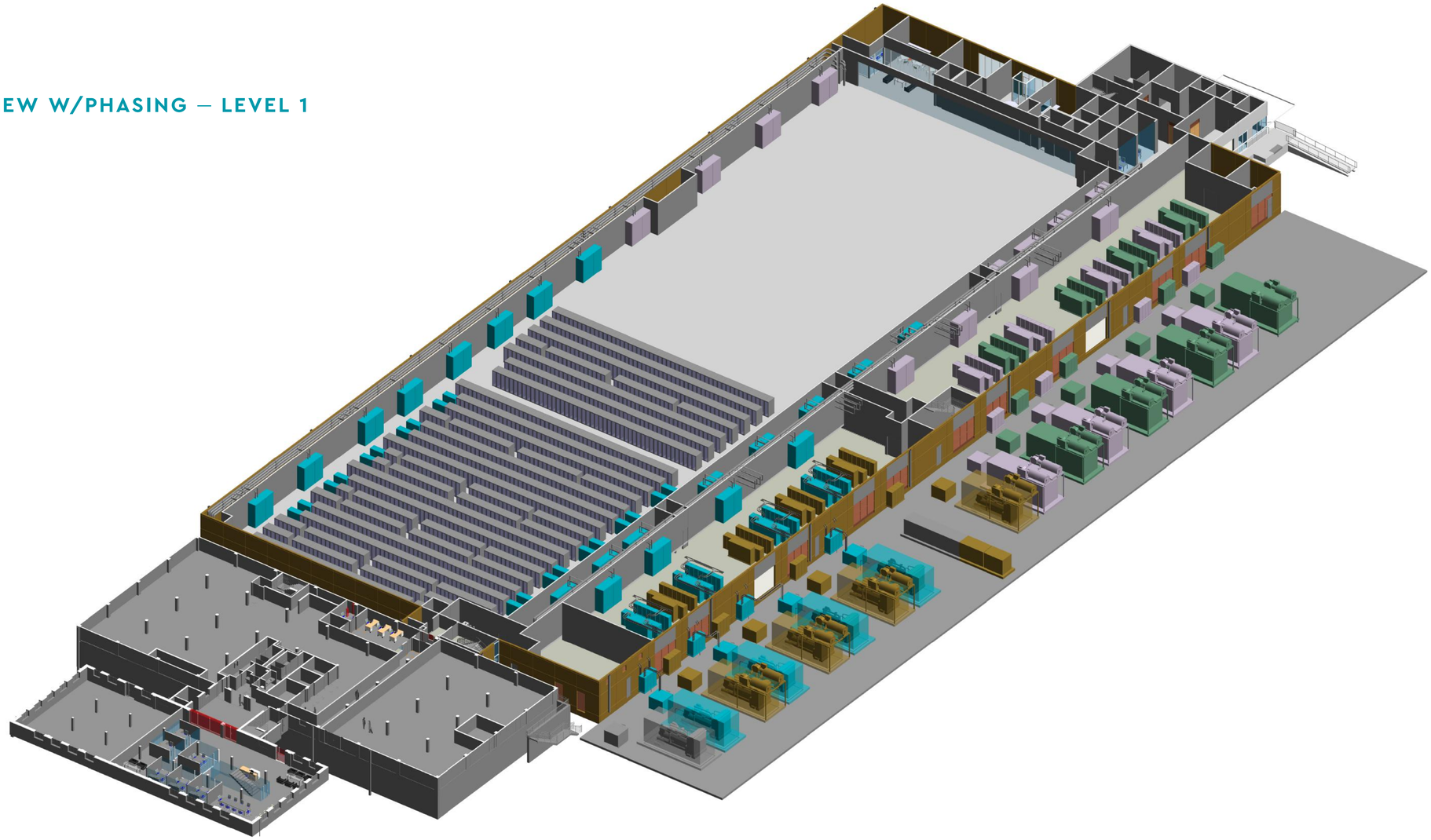
M. SECURITY SYSTEM

1. Access Control
    a. Provide distributed security headend equipment, controllers, power supplies, and connections to establish a complete, integrated access control and perimeter security system
        i. Security system manufacturer shall be Openpath. (www.openpath.com)
    b. Provide mantraps at strategic access points for the Data Center spaces, such as the visitor entry point to Building C
    c. Provide electrified locking and card access at the following rooms or areas:
        i. Perimeter gate ingress/egress points
        ii. Drive entry points
        iii. Main building entrances of A, B, and C
        iv. Back of house entrances
        v. Control center
        vi. Security areas
        vii. Data Halls
    d. Biometric/Face recognition
        i. Provide biometric readers with 2-factor authentication at:
            - Data Halls (second access door)
2. Video Surveillance
    a. Provide high-definition video surveillance cameras associated networked video storage, and all required appliances and equipment to form a complete and functional video surveillance system.
        i. Surveillance system manufacturer shall be Milestone
    b. Cameras shall be IP, full color, minimum 4 megapixel with IR night vision
    c. Cameras shall be POE
    d. Include integrated video motion detection.
    e. Provide surveillance coverage at:
        i. Site perimeter and fence lines
        ii. Building perimeter and entrances
        iii. Ingress / egress paths
        iv. Lobbies
        v. Corridor through Building B
        vi. Security areas and mantraps
        vii. Data Halls and back of house areas
        viii. Roof parapets

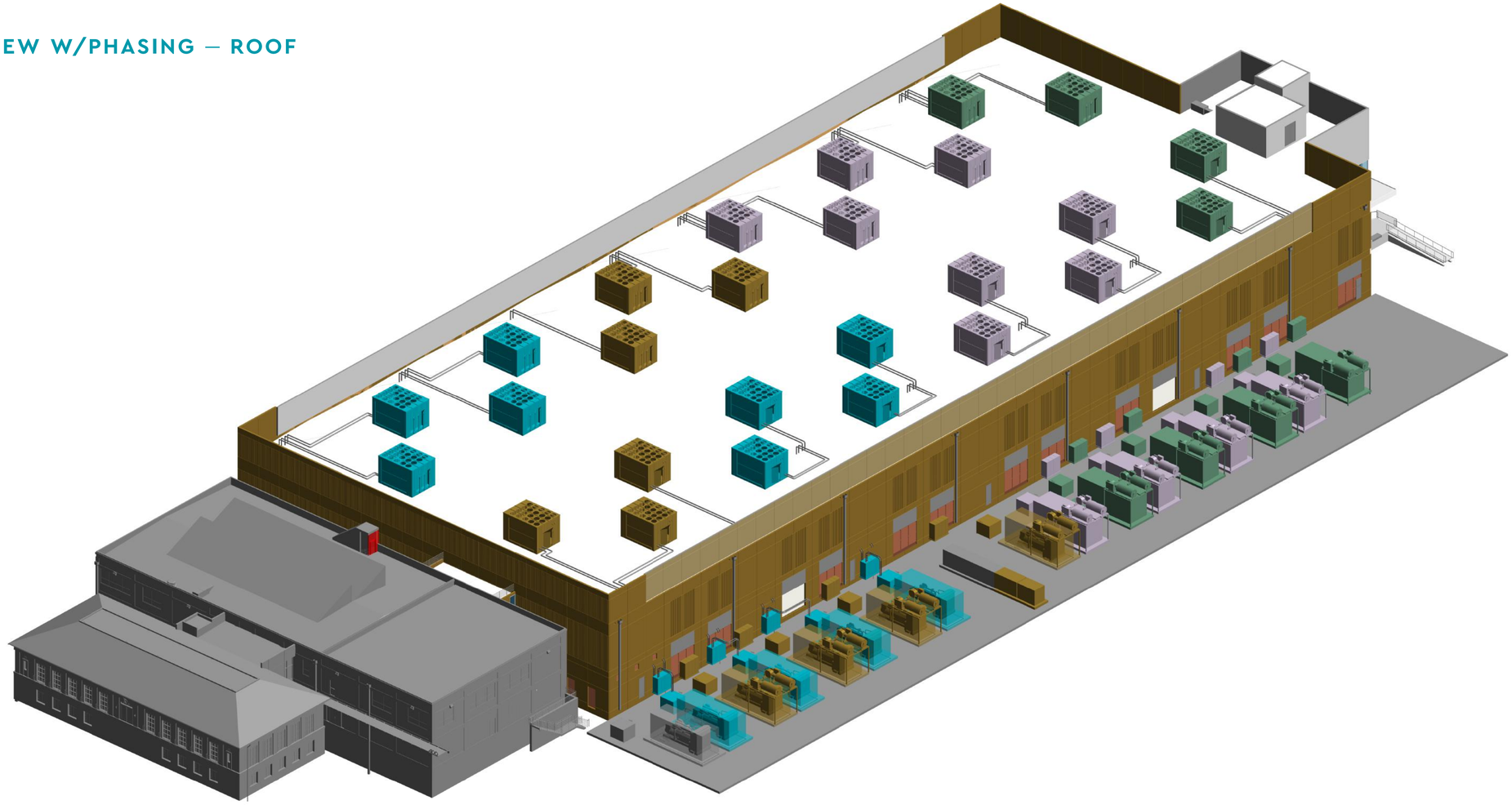

Redundant ISP connections
with physically separate paths
Ten (10) - 4 inch conduits.
MMR
MMR
Building C
Redundant ISP connections
with physically separate paths
Ten (10) - 4 inch conduits.
WEST
VAULT
EAST
VAULT

6. PLANS, DRAWINGS & RENDERINGS

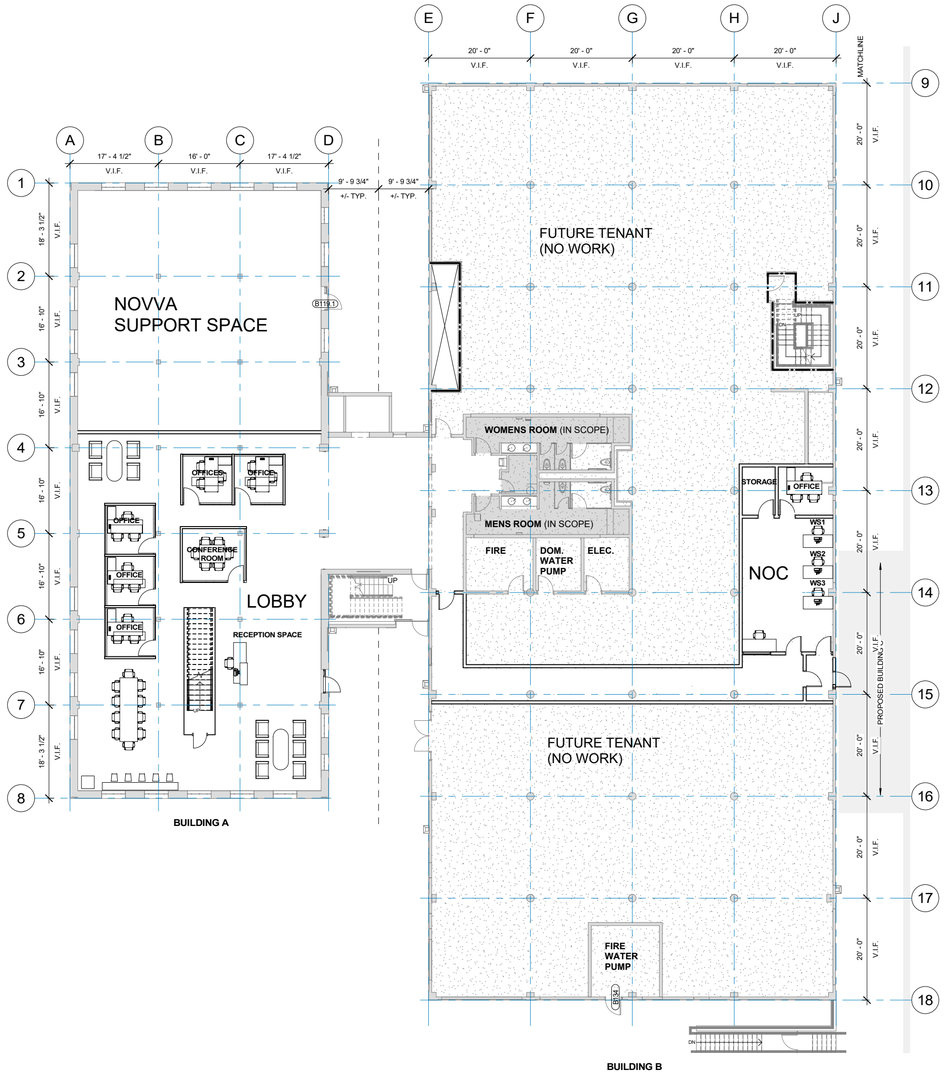
OVERALL VIEW W/PHASING – LEVEL 1



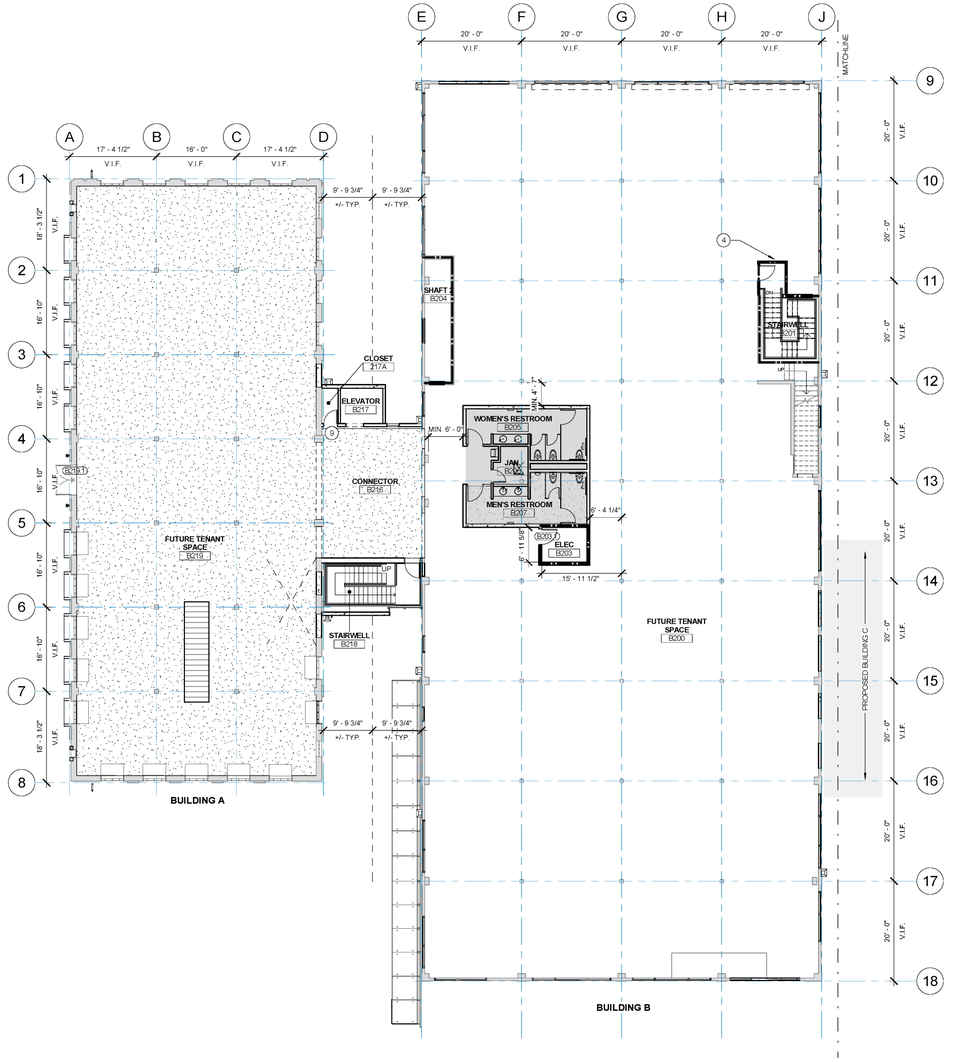
OVERALL VIEW W/PHASING – ROOF



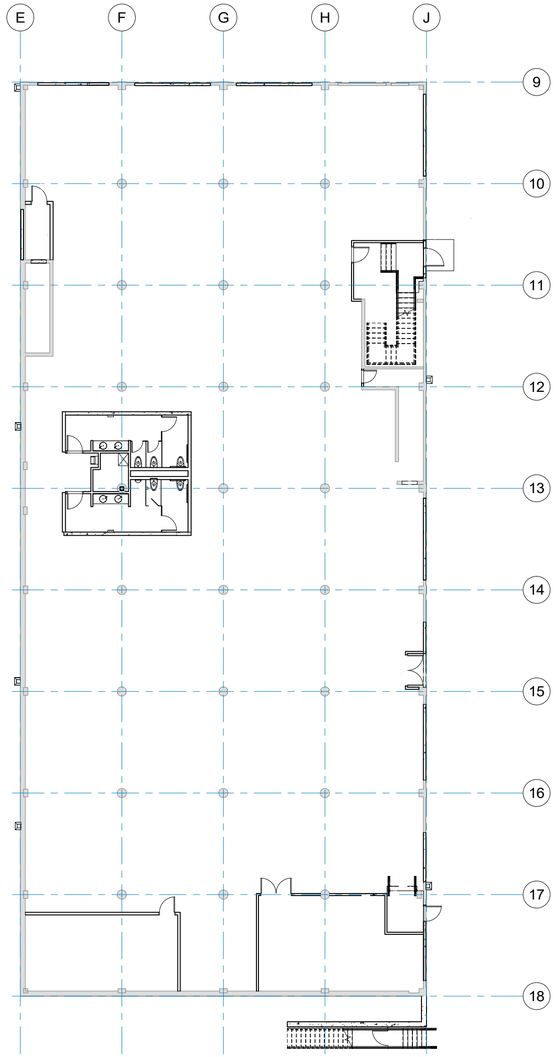
BUILDING A/B - LEVEL 1 FLOOR PLAN



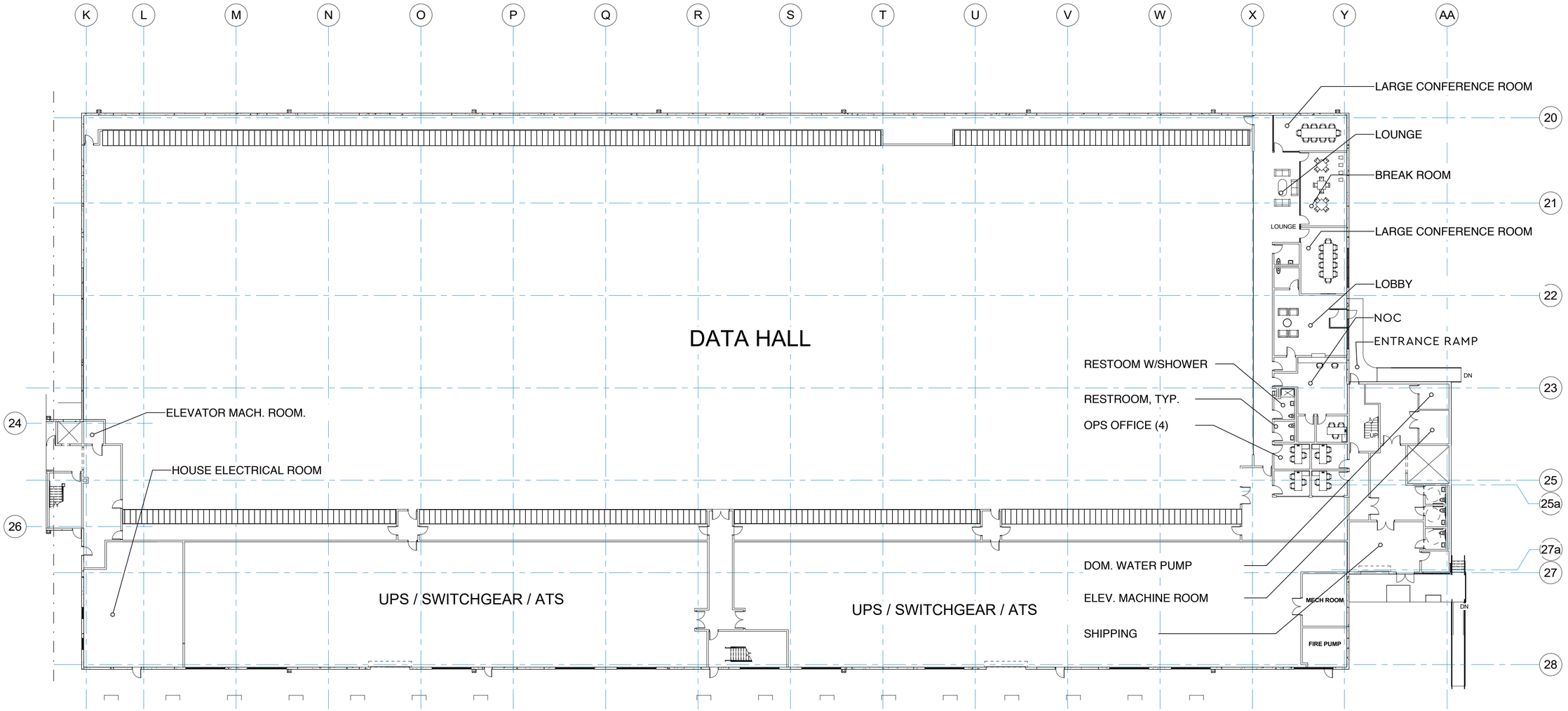
BUILDING A/B - LEVEL 2 FLOOR PLAN



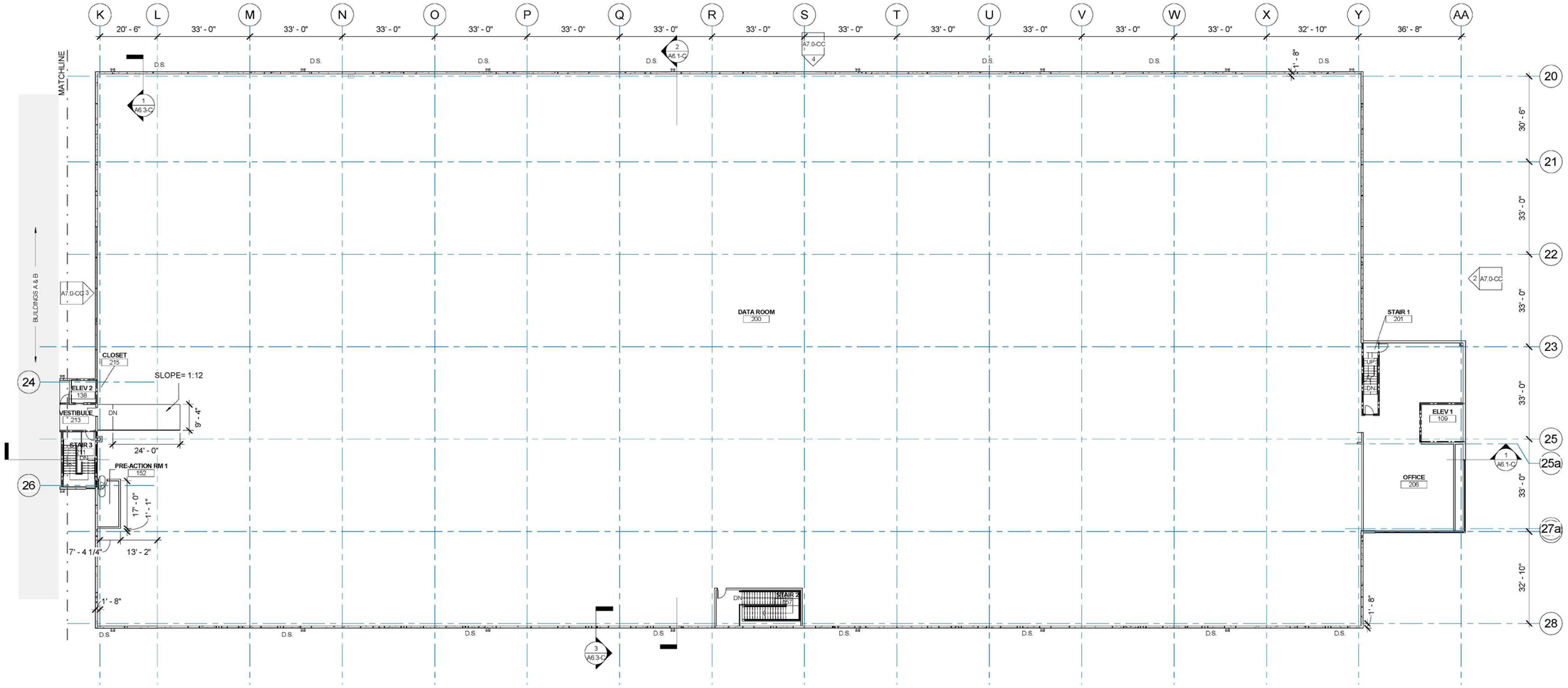
BUILDING B - BASEMENT FLOOR PLAN



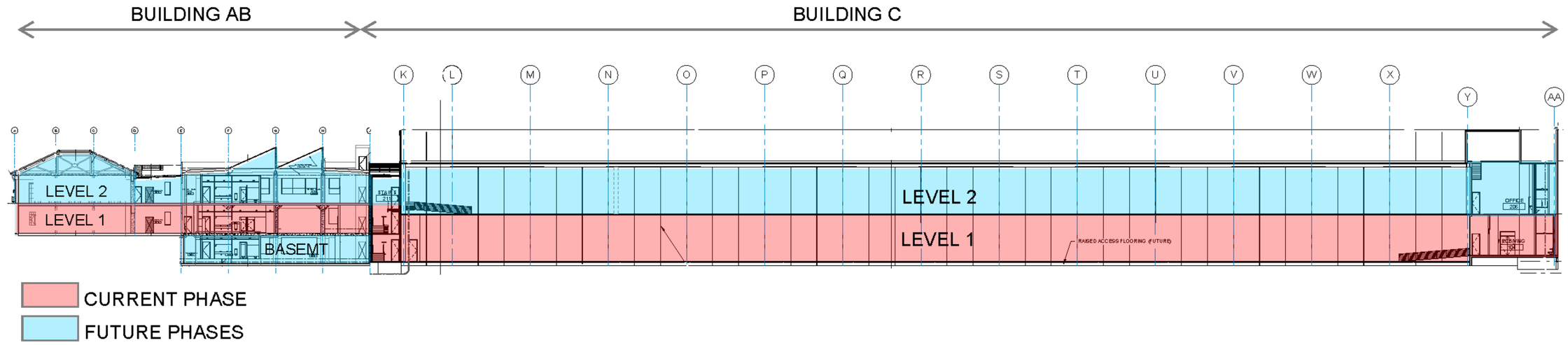
BUILDING C - LEVEL 1 OVERALL PLAN



BUILDING C - LEVEL 2 FLOOR PLAN



BUILDING A/B/C - SECTION OVERVIEW



BUILDING A/B - LEVEL 1 LOBBY (VIEW FACING NW)

BUILDING A/B - LEVEL 1 LOBBY (VIEW FACING SW)

BUILDING A/B - LEVEL 1 OPEN CONFERENCE (VIEW FACING NE)

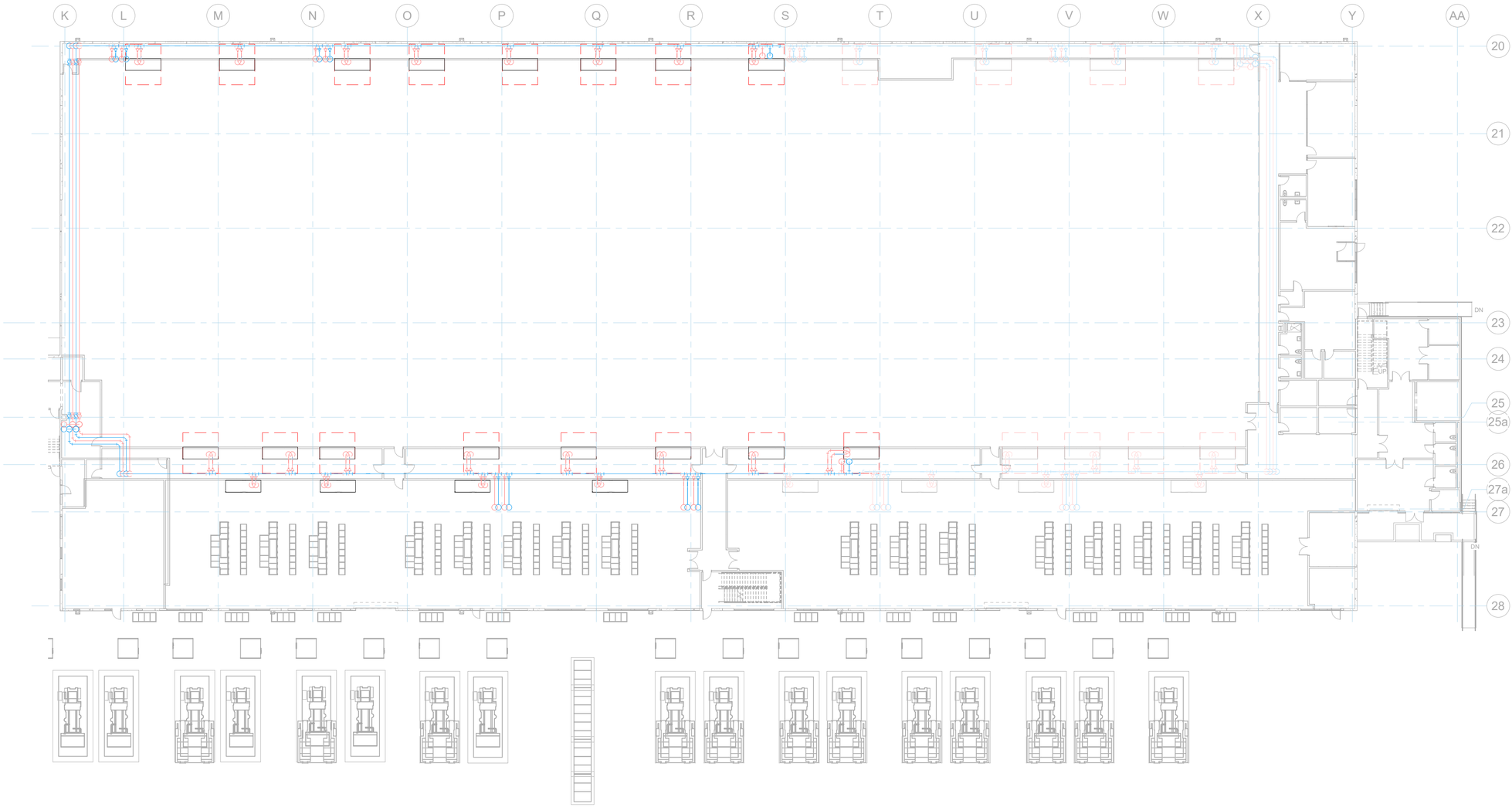
BUILDING A/B - LEVEL 1 LOBBY (VIEW FACING W)

BUILDING C - LEVEL 1 LOBBY (VIEW FACING NW)

BUILDING C - LEVEL 1 BREAK ROOM (VIEW FACING NE)

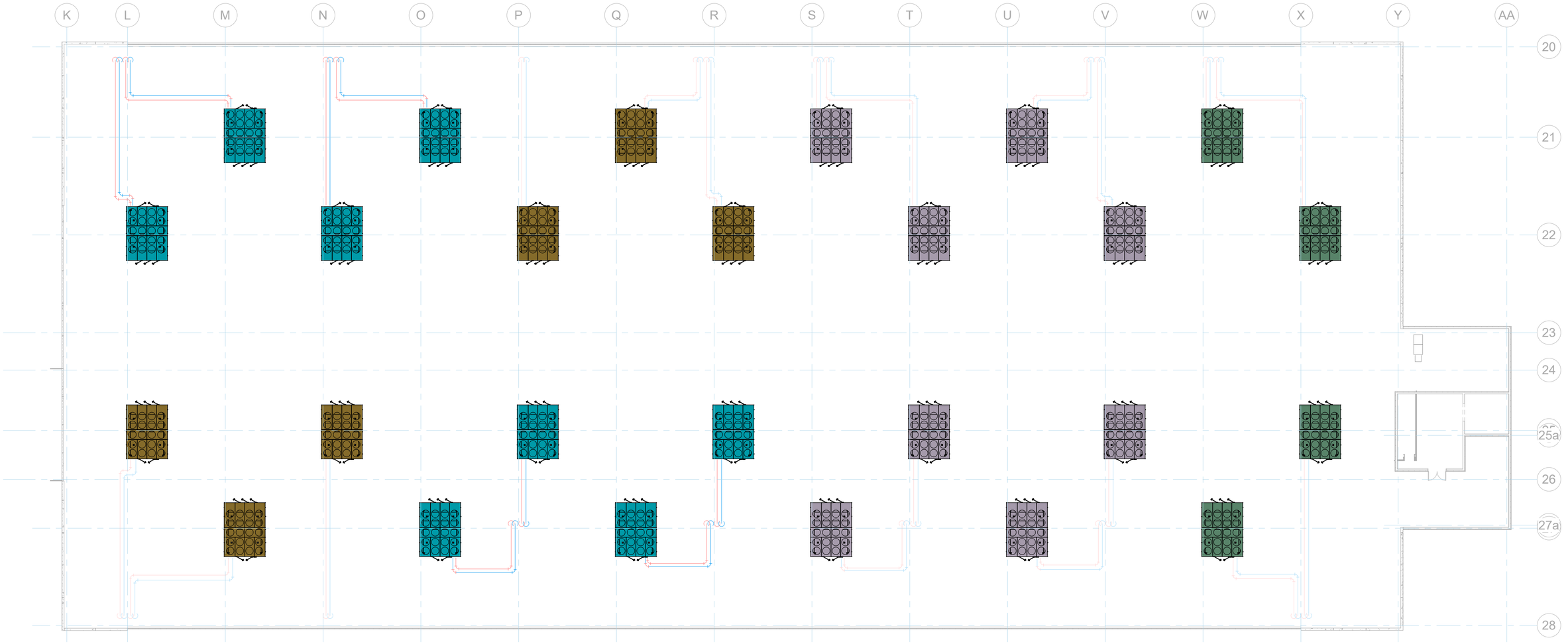
BUILDING C - LEVEL 1 LOUNGE (VIEW FACING NE)

BUILDING C - LEVEL 1

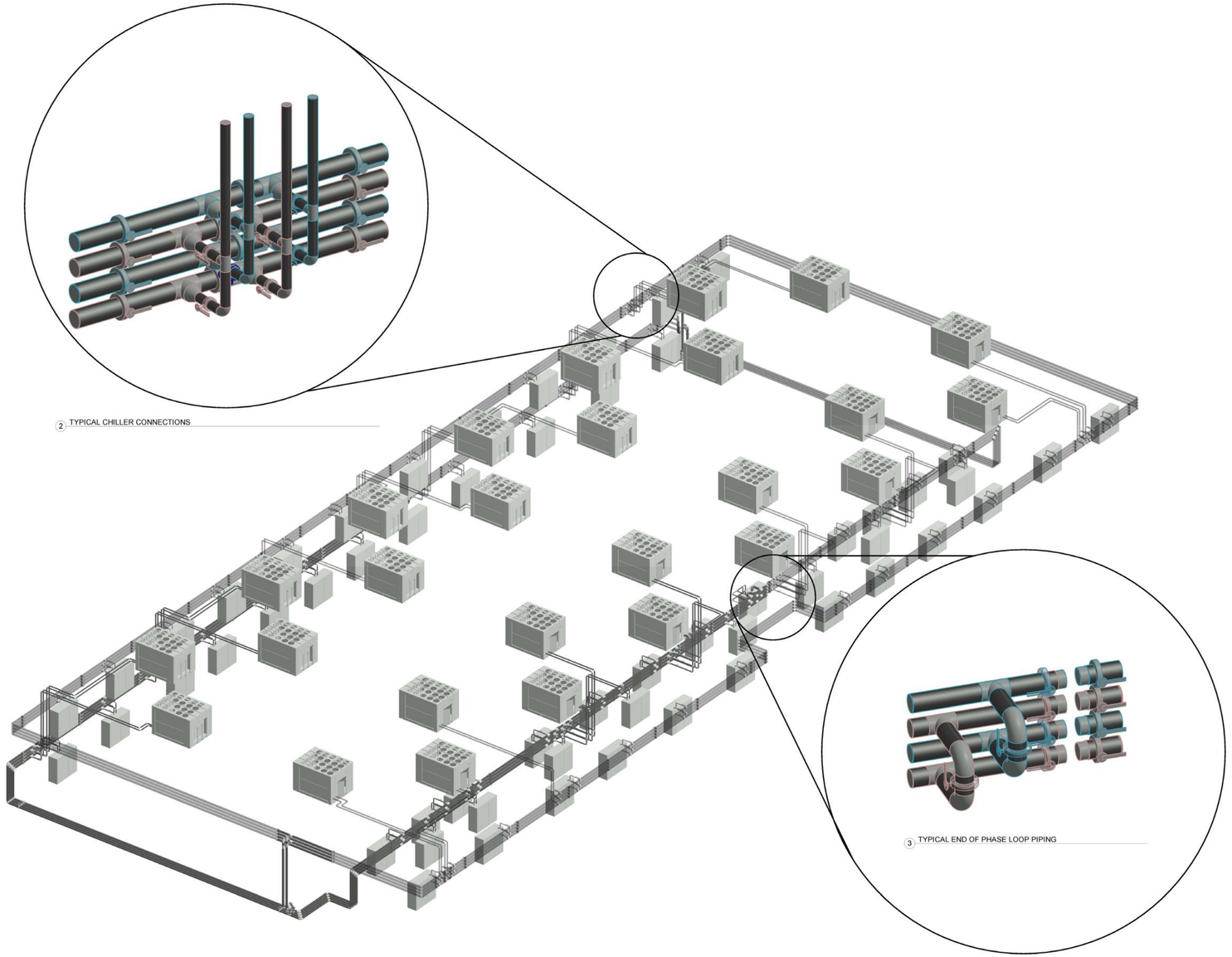


BUILDING C - ROOF, AIR COOLED CHILLER LAYOUT

PHASE 1 | PHASE 2 | PHASE 3 | PHASE 4



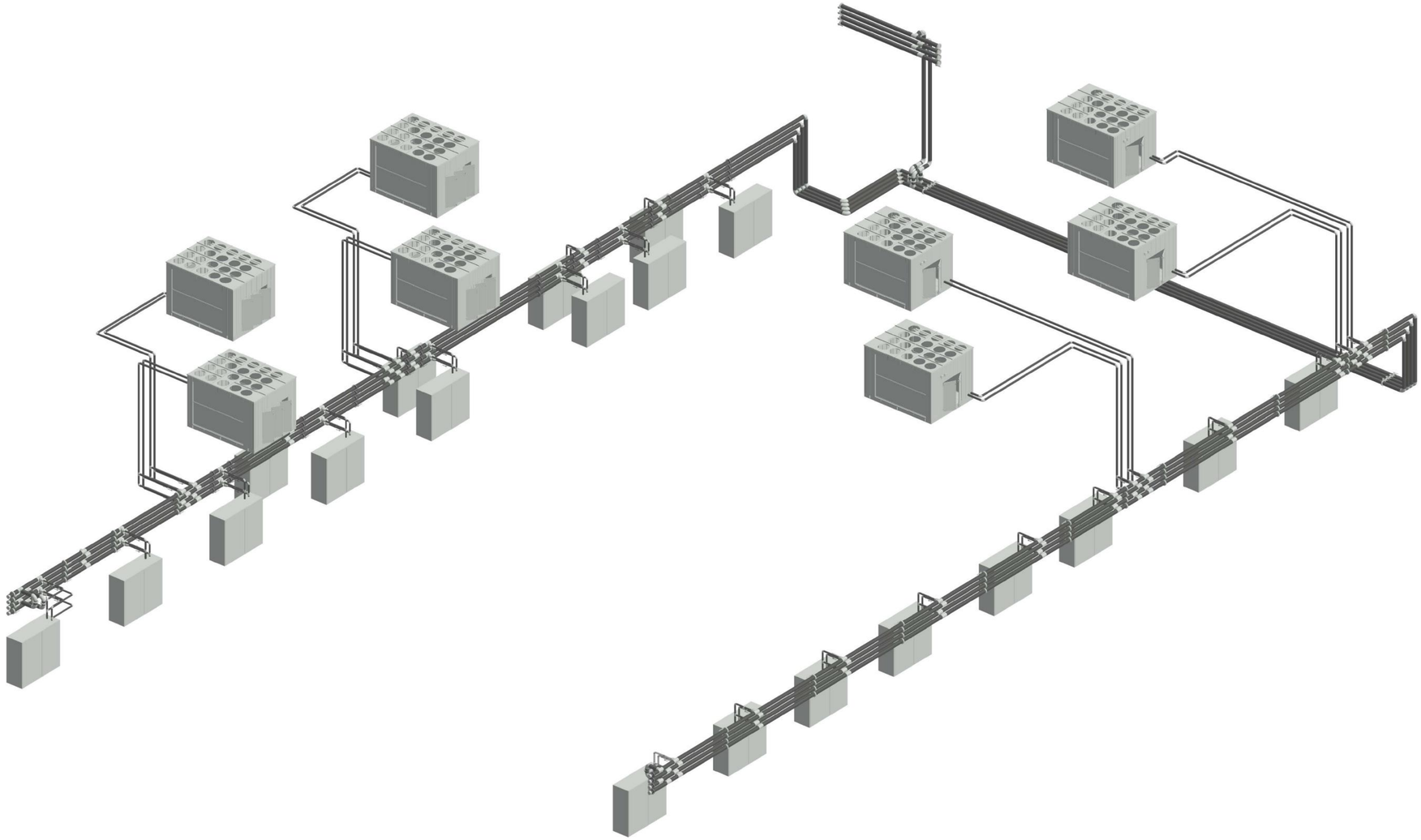
PIPING ISOMETRIC-MASTER PLAN



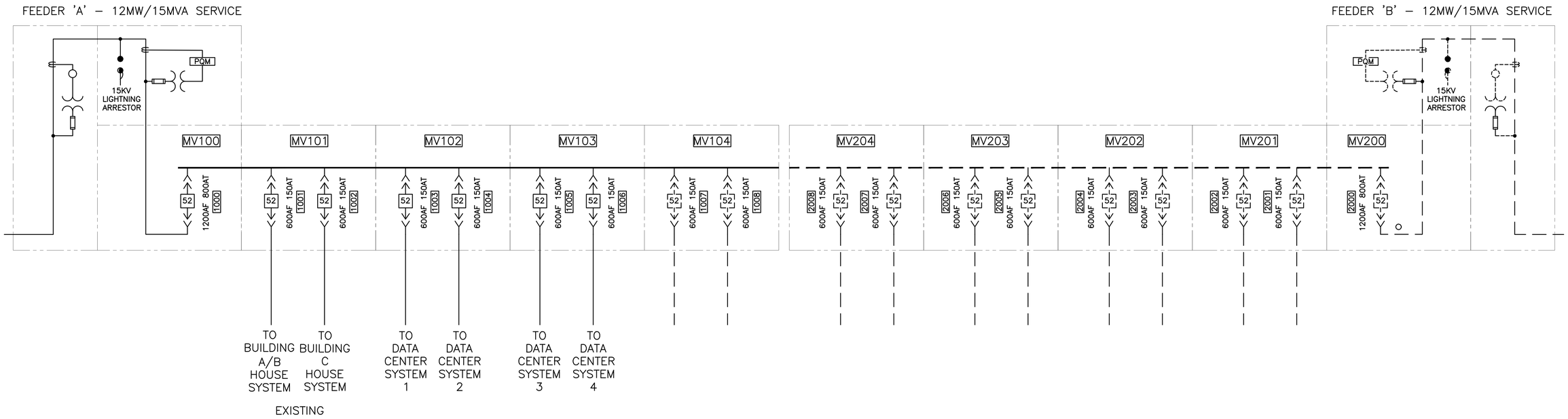
2 TYPICAL CHILLER CONNECTIONS

3 TYPICAL END OF PHASE LOOP PIPING

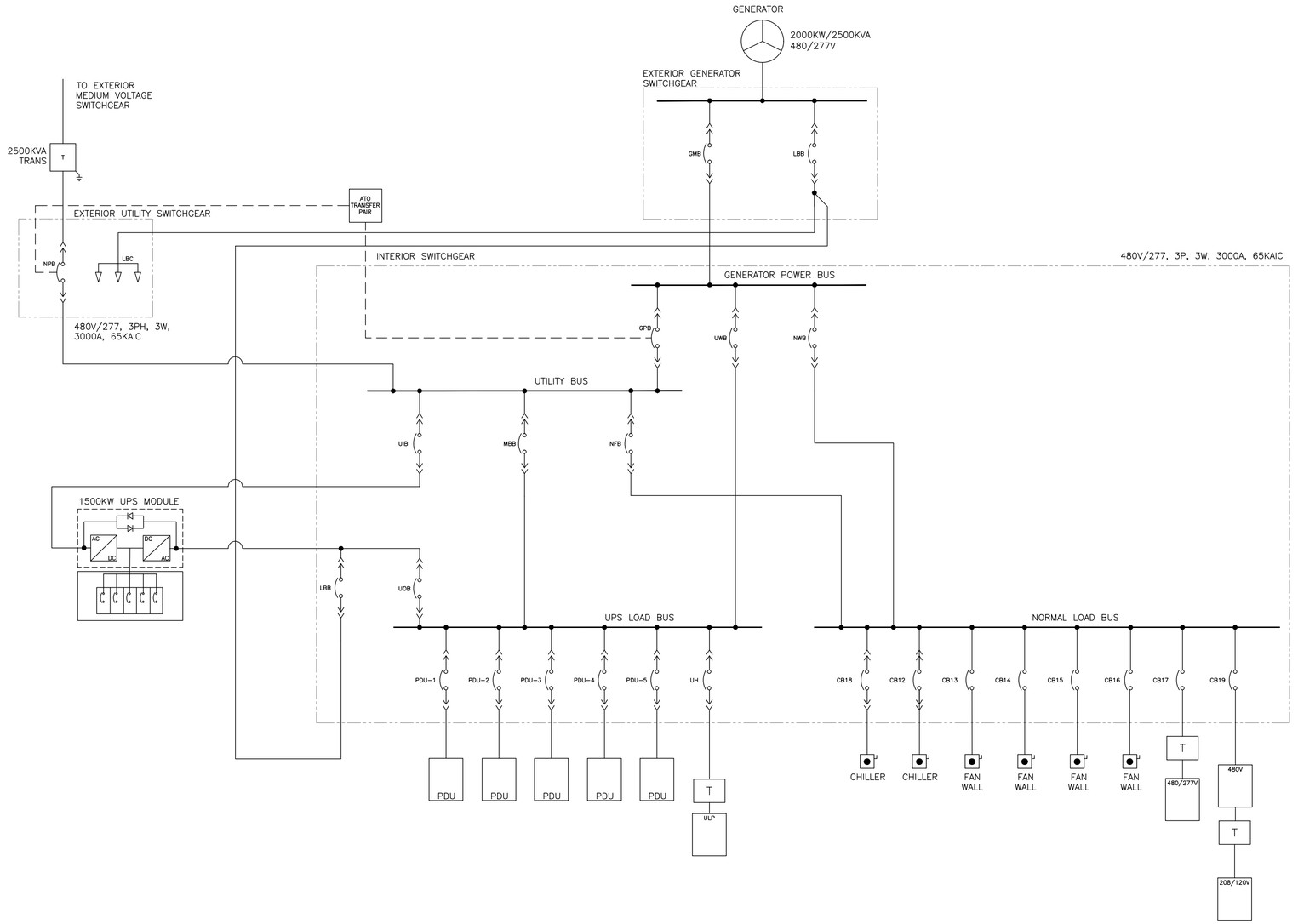
PIPING ISOMETRIC-PHASE I



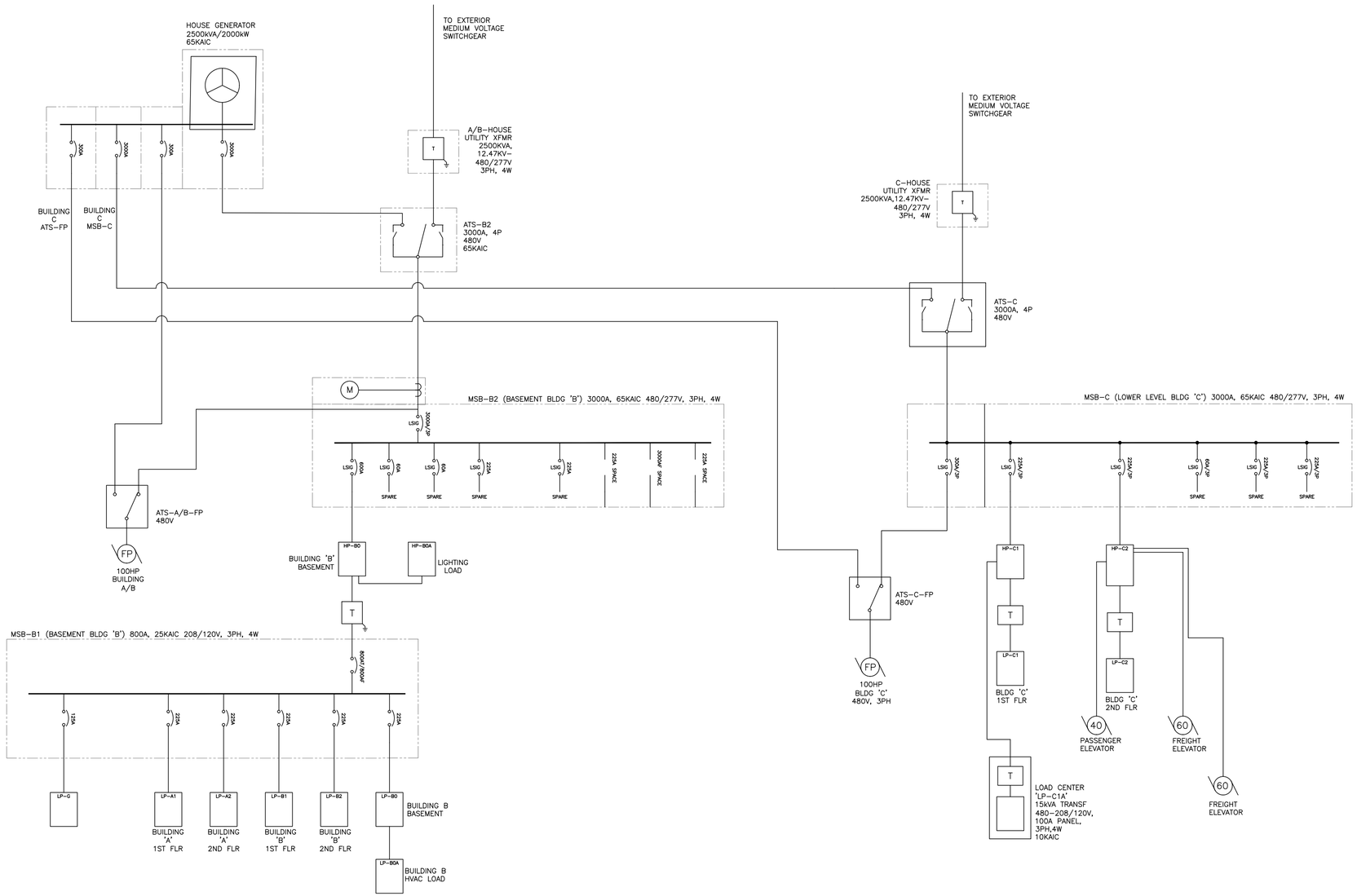
ONE LINE - MEDIUM VOLTAGE



ONE LINE - TYPICAL DATA CENTER SYSTEM



ONE LINE - HOUSE POWER



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