EXHIBIT F

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SCHEMATIC DESIGN REPORT

DEJARDIN ADDITION AND RENOVATION
CLACKAMAS COMMUNITY COLLEGE
OREGON CITY, OREGON

23 AUGUST 2017

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Below:
Aerial showing DeJardin Hall and new addition

1 ARCHITECTURAL

ARCHITECTURAL NARRATIVE

As part of the approved bond work in November 2014, Clackamas Community College (CCC) is building an addition to DeJardin Hall. Scheduled to open in Fall 2019, the 22,500 gsf addition will consolidate existing science program spread across multiple buildings into one science complex. The building will also help accommodate continuing growth of the science department which is among the fastest growing on campus. As part of this project, a small portion of existing space in DeJardin will be remodeled to accommodate offices, student spaces, and a new classroom.

COLLEGE GOALS

A visioning session with college faculty and stakeholders helped identify priorities for the DeJardin Addition. The following terms have helped frame concept design and drive stakeholder decisions:

:: Sense of Discovery
:: Functional
:: Adaptive Environment
:: Biophilic Design
:: Connectivity
:: Collaborative
:: Inclusive

SITE CONTEXT

DeJardin Hall sits at the southern edge of campus; adjacent to South Douglas Loop which encircles the main campus. To the north, the Pauling Center and Rook Hall provide the closest building connections. As envisioned in the 2015 CCC Masterplan, the DeJardin Addition along with Rook Hall and a future Student Services / Community Commons will serve as framework for a new campus gateway.

Campus Context

Built in a series of phases, the campus is primarily a mix of late mid-century structures and early 2000's contemporary buildings. Building materials are predominantly an earth red brick with gray accent metal panel. Building arcades and sawtooth clerestories feature prominently across campus and create a unique architectural vocabulary. Sawtooth clerestories are integral to the character of the Pauling Center and have provided inspiration for similar features on Rook and DeJardin.

EXISTING BUILDING

Construction

DeJardin Hall was completed in 2004 and is 18,500 gsf. It is a steel structure with composite deck and a brick veneer and metal panel cladding. Floor to ceiling storefront distinguishes the ground floor entries while storefront ribbon window typifies labs and offices.

Building Form

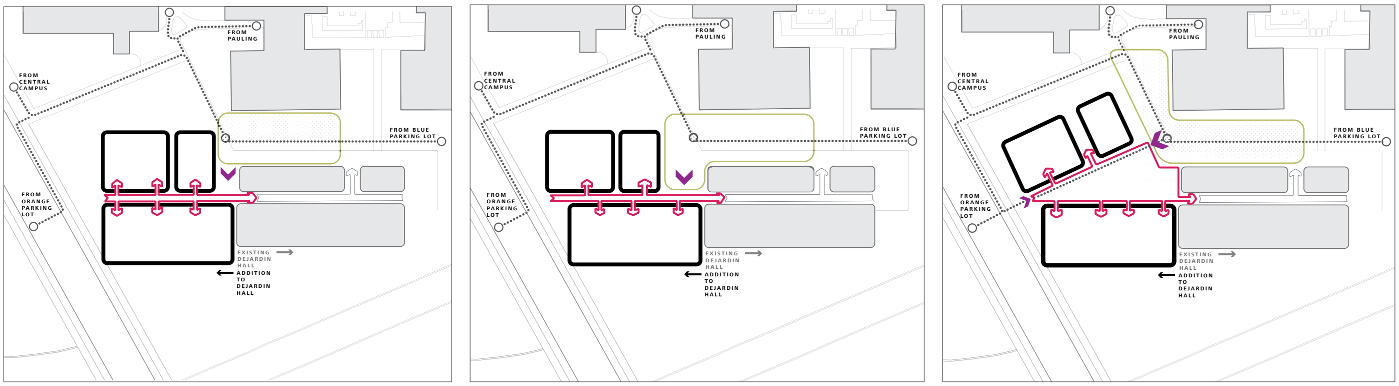
DeJardin is a double loaded corridor with student spaces at either end. The building plan is oriented in the east/west direction which helps with the overall building energy loading and respects the existing orthogonal campus grid.

Interior Character

Classrooms, labs, offices, and support spaces are located on either side of a wide corridor with student and flex spaces located around two open stairs. Existing materials include carpet, gypsum lid ceilings, and painted gypsum walls. Concrete and steel expressions are primarily centered around stairs and student study. The overall character is clinical and efficient. Daylight at either end of the corridor is abundant and provides nice views, especially to the east.

Below:
Diagram of splayed double loaded corridor

Opposite, Upper to Lower:
View from East, View from North, View from South Douglas Loop



BUILDING CONCEPT - EXTERIOR

Building Addition

Careful consideration was giving to respecting existing context and balancing the College's goals. Building upon the double loaded corridor of the existing DeJardin, the addition is fundamentally a splayed double loaded corridor with student space in the center instead of the ends. Alignment with the existing corridor allows for uninterrupted connections between old and new and respects the existing campus grid.

Exhibit

The splayed double loaded corridor provides not only an efficient use of space but allows collaboration space to be at the heart of the building. Lab and support spaces look into a centralized space while at the same time letting those same spaces be on display. This allows the building and its program to be on "exhibit." Educational spaces have access to exterior views and to share in a larger internal community reminiscent of the existing Pauling Center. Building upon the connection to Pauling, sawtooth roof monitors cover the extent of the public central space, providing natural daylight into the heart of the building and creating a powerful connection to the past. The exhibit space is the figurative and literal spine of the building.

A New Home

Key to the addition is to create a home for the sciences at CCC. This is done by respecting aspects that work at Pauling currently while remedying those that are less successful. External circulation is minimized while a larger internal centralized space has connections to program and an exterior plaza. To aid in clear way finding, both entries open directly into this central hall. The character of the central space evokes the spirit of the Pauling Center's community spaces and helps build upon Pauling's sense of child like wonder.

BUILDING MATERIALS AND MASSING

Massing

The building addition is conceived as rib cages (lab bars) connected by a central spine (common space). The exterior form reinforces this language as the spine is expressive in form and open while the bars are solid and protective. Curtainwall highlights the common space while punched windows are primarily in focused in the bars. The curtainwall creates a beacon for the entries providing large sections of transparency in otherwise opaque volumes. The spine connects the entire building together and reads as a series of sawtooth roof monitors tying back to surrounding building context.

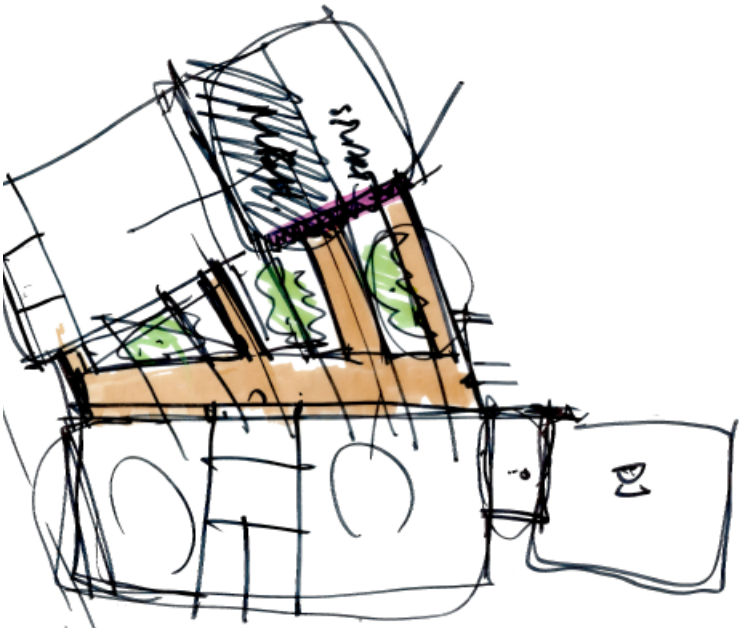
A curtain wall bridge connects the existing DeJardin with the addition. This breaks down the perceived length of the building and has the constructibility benefit of not attaching along the full face of an existing building.

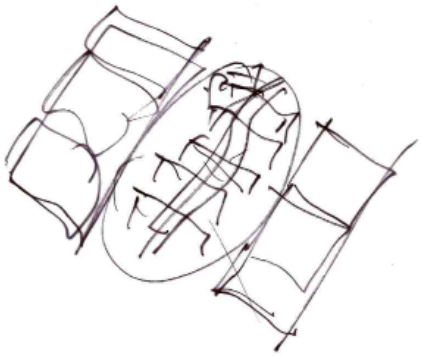
Materials

To ensure the addition compliments existing DeJardin Hall, similar materials and colors will used. While the brick that was used on the existing building is no longer available, options are available to get an analogous color. Brick will be used on the bars and will represent the majority of skin for the addition. Aluminum storefront and spandrel panel will be used to break up the brick mass. Corrugated box rib will match existing and be exclusive to the building spine. Curtainwall will intersperse with the box rib and form entries and the bridge. A flat metal panel, matching the brick color, will be in selective areas to provide textural contrast and volumetric scale.

Below:
Concept sketches

Opposite, Upper to Lower:
View of exhibit space from bridge
View of exhibit space looking NE





BUILDING CONCEPT - INTERIOR

Clarity + Connection

The primary east/west corridor, linking the existing building and the new building, acts as a circulatory spine feeding into new labs to the north and south. Extension of this established route and the stacking of lab spaces between the two floors lend clarity to way finding. These essential program elements, organized in volumes, surround and overlook a light-filled communal space on the first floor that will serve as a connective hub, flexible enough to support freestanding exhibits, collaborative study groups and small DeJardin community events. Second floor study and enclosed tutoring spaces are easily accessed via a new central stair and offer quiet spaces for more focused learning.

The central communal space, immediately adjacent to the entry vestibule, will offer a dynamic and ever-changing welcome. The Cougar Connect desk, located in this hub, will further activate the space as entering/exiting students interact with staff. Built-in display cases located along primary circulation and curated to exhibit class curriculum, will add enriching layers and visual texture to the space. White boards and tack boards strategically located will support impromptu study and tutoring sessions.

All labs will have exterior windows, supplying natural daylight and views. In lab prep and study rooms without exterior windows, interior windows and relites will provide daylight from the central monitors. Full and part time faculty offices in the existing DeJardin building will be partially reconfigured to meet program requirements and will borrow daylight with relites to corridors.

The Student Study Lounge will provide a mix of semi-enclosed study pods, group work tables and casual seating . The lounge's second floor location offers views overlooking both the exterior courtyard and the interior communal space for visual connectivity, it remains removed enough to ensure quiet, concentrated studying.

Materials

Interior materials will be economical, durable and considerate to CCC campus standards. Polished concrete floors will define both lab and public spaces while quieter spaces such as study lounge and enclosed offices will have carpet tile. Ceilings along the primary corridor will expose and express building systems through a framework of galvanized unistrut ribbing, labs will have a mix of dropped gypsum ceiling and acoustical ceiling tile. Study spaces and central monitor ceilings will be finished with gypsum to maximize even distribution of natural daylight to the communal flex space below. As budget allows, the use of wood will help to balance and warm the material palette, it will be used on doors, display casework and built-in study furniture. A large graphic on the south wall of the central flex space will convey whimsical science-based artwork at an amplified scale. A concrete plinth at the base of the new central stair will have integral planters that support the growth of large indoor plants.

Below:
Views into the Public Space

SPECIFICATION INFORMATION

This information is being provided to assist the cost estimator. This section contains items considered to be part of the "base bid". Alternates and allowances have been included at the end of this section, and the cost differentials should be carried as line items.

DIVISION 3 - CONCRETE

For information on Concrete Slabs and Reinforcing, refer to Structural Narrative in the following pages.

UNDERSLAB

Provide underslab sheet vapor retarder complying with ASTM E1745 Section 7 under concrete slabs on grade. Retarder to be a multi-layer plastic extrusion manufactured with only high grade prime, virgin, polyolefin resins. Retarder to be 15 mils with a water vapor permeance of not more than 0.010 perms maximum. Basis of design to be Stego Wrap or similar.

CONCRETE FLOOR FINISHING

Polished Concrete as located on the finish plan to be Grade 1, Light Sand Finish, Class 2 Medium reflectivity, 800 grit. Clear finish, stain, and slip resistant.

DIVISION 4 - MASONRY

Veneer Unit Masonry where shown on exterior elevations. **BP-1**to be Norman Brick in running bond pattern. BP-1 to have a mix of 35% smooth finish and 65% mission finish Brick Pattern **BP-2** to be Norman Brick in soldier course pattern. BP-2 to be 100% mission finish.

DIVISION 5 - METALS

For information on Structural Steel and exterior framing , refer to Structural Narrative in the following pages.

STAIRS

Metal Stairs to be folded steel plate with sealed and polished concrete treads and risers. Associated guardrail at stair and second floor openings to be 14 gauge custom cut or patterned, powder coated metal panel.

DIVISION 6 - WOODS, PLASTICS AND COMPOSITES

For information on Laboratory Specific Casework, See Division 11.

Architectural wood casework refers to casework located in the Public Areas, such as the exhibit space, student study areas, corridors, and restrooms. Display cases at the corridors and exhibit space to be rift oak veneer, with tempered low iron glass and integral 90+ CRI LED lighting. Booths at Student Study Space, 2nd floor to be a mix of rift oak veneer and matching solid wood. Architectural Casework to be constructed per AWI premium grade custom wood fabrications.

Restroom Countertops and backsplashes to be Solid Surface such as Caesarstone or equal.

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

INSULATION

Thermal insulation at exterior wall assemblies to include Extruded Polystyrene Board Insulation to meet ASTM C578 with Flame Spread Index of 25 or less, and Smoke Developed Index of 450 or less. R-Value of rigid insulation to be R-7.5ci. Exterior Studs to include Glass Fiber Batt Insulation flexible preformed batt or blanket, complying with ASTM C665, friction fit, Typ I, Class A. Batt Insulation to be full depth of stud cavity, with a minimum R-Value of R-13. Provide R-15 under heated slab area.

WEATHER RESISTIVE BARRIER

The Primary water resistive air barrier membrane shall be a self-adhering reinforced modified polyolefin tri-laminate sheet air barrier membrane for wall construction, specifically designed to be water resistant and vapor permeable. Adhesive backing to be protected with 3 piece release film. Air permeance to be 0.004 cubic feet per minute per square foot, maximum, and Water Vapor permeance to be 10 perms minimum. Basis of design to be Henry VP160 by Henry Company, or equal.

METAL PANEL

The project will include two types of Metal Panel. **MP-1** to be a corrugated box rib zincalume coated steel metal panel to match the existing building with custom color finish to match. **MP-2** to be flat zincalume coated steel metal panel with 12 inch cover width and concealed fasteners with custom color finish as selected by architect. Finish for both panel systems to be a baked-on fluoropolymer coating with 70% PVDF in resin per AAMA 2605. MP-2 basis of design to be Morin metal panels CF series panels type F-12-S or similar.

ROOFING

Flat Roofs to be a built-up roofing system, Cold process, minimum three (3) ply asphalt composite felt, cold applied membrane system and cool roof rated aggregate surface over coverboard and polyisocyanurate insulation. Polyisocyanurate flat and tapered insulation to achieve R-value of R-20ci. Adjust built up roofing at low roofs to accommodate gravel ballast to obscure views from upper floors. Roofing at rooftop monitors to be standing seam metal roof.

Sheet Metal Flashing and Trim to be primarily composed of prefinished sheet metal in custom colors to match metal wall panels.

DIVISION 8 - OPENINGS

DOORS AND FRAMES

All interior door and relite frames to be Hollow Metal Frames, primed and ready to receive painted finish. Exterior door frames not part of storefront or curtain wall system to be galvanized hollow metal frame, primed and ready to receive painted finish.

Exterior doors not part of storefront or curtain wall system to be steel doors. Doors to meet ANSI A250.8, 1-3/4 inch thick. Level 2 - Heavy Duty, Model 2, seamless design. Shop finish steel sheet galvanized to ASTM A653.

At all interior locations, provide wood veneer doors to be Rift cut white oak. All office doors to include vision panel.

WINDOW SYSTEMS AND GLAZING

Aluminum Entrances and Storefront as indicated on drawings. Basis of design to be Kawneer Tri-Fab 601T or similar. Finish to be selected from manufacturer's standard line of anodized finishes.

Glazed Aluminum Curtain Walls as indicated on drawings. Basis of design to be Kawneer 1600 LR Wall Curtain Wall system, or similar.

Exterior glazing to be insulated glazing units with Low E coating similar to SolarBan 60. On West and South facing glazing provide Low E upgrade to Solar Ban 70.

Interior Glazing is required to meet a minimum STC rating of 35. Basis of design to be 1/2" overall monolithic glazing.

DIVISION 9 - FINISHES

INTERIOR WALL ASSEMBLIES

Three types of walls will generally be applied to the project. All interior walls shall extend to structure and be acoustically sealed top and bottom. All penetrations through walls are to be acoustically sealed.

Wall Type 1 - STC 45, to be 3-5/8" or 6" metal studs with 1 layers of gypsum wall boards on both sides, and acoustical batts in cavities. Standard Wall Type unless noted otherwise. Wall type based on WP51.

Wall Type 2 - STC 50, to be 3-5/8" or 6" metal studs with 2 layers of gypsum wall boards on one side and 1 layer of gypsum wall board on the other side, and acoustical batts in cavities. Locate at walls between Laboratory/Classrooms and corridors or public space. Wall Type based on WP1021.

Wall Type 3 - 3-5/8" studs located on each side of brace frame. 1 layer of gypsum wall board on each side.

Finish Levels - Finish in accordance with GA-214 levels.

Level 1 - Above finished ceilings concealed from view.
Level 4 - Walls exposed to view UNO, including behind wall coverings and protections.
Level 4 - Ceilings Exposed to View
Level 5 - At Graphic Wall location noted on drawings.

FLOORING

Floor finishes to be located as noted on Floor Finish Plans.

Porcelain Tile - Large format, 12 x 24 or greater. Epoxy Grout.

Carpet Tile - Mannington or equal, with moisture mitigation allowance.

Sealed Concrete at storage and building support.

Walk off Mat at Vestibules.

Rubber base at all spaces, excluding restrooms.

CEILINGS

Suspended Gypsum and Acoustic Ceiling Tiles as indicated on Reflected Ceiling Plans.

The project will include 3 types of Acoustic Ceiling Panels. **ACT-1** is to be 24 x 24 tiles, with Armstrong Cirrus as the basis of design. **ACT-2** is to be 24 x 48 tile, and requires a high NRC rating, with Armstrong Ultima as the basis of design. **ACT-3** is to be 24 x 48 tile, with Armstrong Cirrus as the basis of design.

PAINTING

Painting and Coating to match Campus Standards.

OTHER FINISHES

Floor to Ceiling large format Ceramic Tile with Epoxy Grout in restroom walls.

Provide Tectum acoustic paneling at underside of slab at exposed corridors.

DIVISION 10 - SPECIALTIES

VISUAL DISPLAY BOARDS

Labs and study spaces shall have both white boards such as Wall Talkers or equal, and tack boards such as Forbo or equal. White boards in Lab or Classroom spaces to be projectable and writeable.

TOILET COMPARTMENTS

Floor mounted, overhead braced partitions to be high-density polyethylene (HDPE) material with orange peel texture, such as Scranton Products or equal.

WALL AND CORNER GUARDS

Stainless Steel Corner Guards to be installed at outside corners in high traffic areas.

FIRE PROTECTION SPECIALTIES

NFPA compliant dry chemical type fire extinguishers and fire blankets in semi-recessed metal cabinets.

TOILET ACCESSORIES

OFCI Accessories - Soap Dispenser, Toilet Paper Dispenser, Sanitary Napkin Receptacle, Seat Cover Dispenser, Sanitary Napkin Dispenser.

CFCI Accessories - Electric Dryers, Grab Bars, Coat Hooks, Diaper Changing Station, and Mirrors. Mirrors in restrooms to be full width of lavatory counter area and from top of backsplash to ceiling.

DIVISION 11 - EQUIPMENT

LABORATORY CASEWORK

Wood Laboratory Casework to follow Architectural Woodwork institute "Architectural Woodwork Quality Standards" Custom Grade, manufactured by CiF Lab Solutions, Kewaunee Scientific Corp, Mott Manufacturing, Diversified Woodcrafts, or Pacific Cabinets. Wood species and veneer cut to be white oak with slip matched layup pattern. Provide Factory finished chemical resistant acrylic urethane finish applied to unstained surface or over stain of selected color. Design to be Square edged full flush overlay design. Provide 1" thick adjustable shelving.

Metal Laboratory Casework to be manufactured by Air Master Systems, Bedcolab Ltd, CiF Lab Solutions, Jamestown Metal Products, Kewaunee Scientific Corp, or Mott Manufacturing Ltd. Finish to be chemical resistant, high grade laboratory furniture quality electrostatically applied powder coat of selected color, baked to a smooth, hard satin finish. Design to be square edged inset metal construction. Fume hood cabinets to be Purpose designed metal cabinet to conceal cup sink and plumbing. Corrosives storage cabinets to be vented cabinet with corrosion resistant liner.

Flammable liquid / solvent storage cabinets to be metal cabinets designed and labeled specifically for the storage of flammable liquids.

Hardware for all Laboratory casework to be 1/4" Diameter stainless steel wire drawer and door pulls, with stainless steel 5-knuckle institutional type hinges, zinc-coated steel full extension ball-bearing drawer slides, adjustable seismic hold-down pin-type shelf supports, black rubber or vinyl leg shoes, label holders, adjustable-type spring-actuated nylon roller door catches, and spring elbow catches.

All laboratory casework work surfaces, unless noted otherwise, to be 1" thick chemically resistant modified epoxy resin molded work surfaces.

Adjustable wall shelves include 1 inch thick, 7 ply shop sanded exterior grade veneer plywood shelving with K+ face veneers with chemical resistant plastic laminate both surfaces, and 3mm edgebanding. Slotted standards are to have epoxy paint finish.

Adjustable Reagent Shelves to be 1 inch thick, 7-ply shop sanded exterior grade veneer plywood shelving with K+ face veneers with chemical resistant plastic laminate both surfaces, and 3mm edgebanding. 2 inches x 2 inches fully welded square steel tube support frame with epoxy paint finish, punched to receive shelving brackets.

Open Industrial Metal Shelf Units to be steel shelf units comprised of five 18 gauge adjustable shelves, 14 gauge angle post supports as manufactured by Systemax inc., List Industries, Hallowell, or Equal.

Pipe drop enclosure, typical to be 18 gauge galvanized steel sheet enclosures with removable cover panels and epoxy paint finish. Provide stainless steel construction where mounted on stainless steel work surface and at stainless steel scullery sinks.

For drying racks, provide stainless steel body with white polypropylene pegs and integral drain trough with welded stainless steel trough ends.

Cylinder Restraint Assemblies consist of Unistrut or equal, No. P-1000 for wall brackets, rails, and legs. Zinc plated, steel chains. Components to be prefinished epoxy paint.

FUME HOODS AND OTHER AIR CONTAINMENT UNITS

Fume Hoods to be manufactured by Air Master Systems, CiF Lab Solutions, Jamestown Metal Products, Kewaunee Scientific Corp, Mott Manufacturing Ltd., or equal. Fume Hoods to be Pre-piped and prewired, and designed to operate safely at face velocities of 100 to 125 feet per minute. Fume hood work surface to be 1 1/4 inch dished epoxy resin in black. At Liner and Baffle, provide fixed glass-reinforced polyester panel, flame retardant and self extinguishing. Finish to be chemical resistant, high grade laboratory furniture quality electrostatically applied powder coat of selected color, baked to a smooth, hard satin finish.

Canopy Hood to be a Custom fabricated stainless steel canopy with all hangers and miscellaneous hardware.

LABORATORY SERVICE FITTINGS AND FIXTURES

Laboratory Service Fittings to be manufactured by Water Saver Faucet Co., T&S Brass and Bronze works, Inc., Broen, Inc., or equal. Finish to be chromium plated with an acid-and solvent-resistant, clear epoxy coat finish specifically designed for laboratory use. Handles to be Four-arm typical, lever handle at accessible sink locations.

Laboratory Emergency Plumbing Fixtures to be manufactured by Water Saver Faucet Co., Guardian Equipment, Haws Corporation, or equal. All emergency fixtures shall be accessible to persons with disabilities. Safety Stations to be Barrier Free with emergency shower actuation valve in stainless steel cabinet for recess mounting and wall-mounted eyewash with stainless steel skirt (Ceiling mounted exposed showerhead). Guardian model GBF2150 or equivalent.

Sinks to include: Cup sinks at fume hoods to be epoxy, oval, with raised lip pattern, Epoxy laboratory sinks, for drop-in installation in work surfaces, as manufactured by Durcon Laboratory Tops, Epoxy Products, or approved equal, Stainless steel sinks, integral with work surface, 18 gauge, and Scullery sinks, 14 gauge stainless steel top with integral sink bowls - provide backsplash, marine edge, drainboards, and leg frame.

LABORATORY EQUIPMENT

Relocate and install Owner's existing floor mounted Autoclave with integral steam generator including disassembly, protection, transportation to new location, installation, seismic anchorage, start up, and testing.

DIVISION 12 - FURNISHINGS

Rollershades, such as mechoshades or equal shall be provided at all exterior windows. Horizontal Louver blinds shall be provided at all interior windows and relites.

DIVISION 14 - CONVEYING EQUIPMENT

Not Used. Elevator is in existing DeJardin Building. A new elevator will not be provided.

DIVISION 21 - FIRE SUPPRESSION

Reference Fire Suppression Narrative.

DIVISION 22 - PLUMBING

Reference Plumbing Narrative.

DIVISION 23 - HVAC

Reference Mechanical Narrative.

DIVISION 26 - ELECTRICAL

Reference Electrical Narrative.

DIVISION 27 - COMMUNICATIONS

Reference Communications Narrative.

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

Reference Electronic Safety and Security Narrative.

DIVISION 31 - EARTHWORK

Reference Landscape Narrative.

DIVISION 32 - EXTERIOR IMPROVEMENTS

Reference Landscape Narrative.

DIVISION 33 - UTILITIES

Reference Civil Narrative.

ALTERNATES AND ALLOWANCES

Provide Pricing information for the following alternates and allowances as line items.

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

ROOFING

In lieu of built-up roofing at Flat Roofs, provide TPO Membrane Roofing. Basis of design to be Firestone UltraPly Platinum TPO, and provide costs for both Fully Adhered and Mechanically Fastened. Provide for 90 mph winds. Membrane to be 60mil overall thickness. Maintain coverboard, insulation, ballast, and standing seam metal roof at monitors, as listed in base bid.

DIVISION 8 - OPENINGS

GLAZING

In lieu of monolithic glazing at interior glazing locations, provide the following options:

1) Insulated Glazing, 1" overall - 1/4" Glass, 1/2" Airspace, 1/4" Glass.
2) Laminated Glazing, 1/4" overall - 1/8" Glass, .045" PVB, 1/8" Glass.

DIVISION 9 - FINISHES

FLOORING

In lieu of rubber base everywhere, provide cost for wood base at corridors only, and rubber base elsewhere.

PAINTING

Provide line item to paint public corridor walls of existing DeJardin building.

ACOUSTICS

Provide allowance for acoustical treatments in the public spaces of the addition.

DIVISION 10 - SPECIALTIES

SIGNAGE

Provide allowance for code required signage.

DIVISION 11 - EQUIPMENT

LABORATORY CASEWORK

In lieu of wood finished wood casework, provide cost for wood grain plastic laminate finish at wood casework. Plastic Laminate to be chemical resistant.

FALL PROTECTION

Provide allowance for perimeter tie off fall protection at roof.

DIVISION 22 - PLUMBING

Price Options for DI Water system as indicated in the Plumbing Narrative.

DIVISION 26 - ELECTRICAL

Provide pricing to refeed existing branch circuits as described in Electrical narrative.

Providing pricing to replace existing fixtures to remain with new energy efficient LED luminaires.

UNRESOLVED ITEMS

SERVICE ACCESS

Service access to DeJardin has not been resolved. Initial locations within the building addition were rejected by the building committee. CCC's preferred location at the east end of existing DeJardin has major conflicts with topography and stormwater facilities.

FIRE TRUCK ACCESS

Fire access has not been designed or accommodated at this stage of the project. Clackamas Fire District #1 has confirmed that they do not currently have fire truck access plans, and they will need to be developed as part of this project.

RADON CONTROL METHODS

Chapter 18, section 1811 of the 2014 Oregon Structural Specialty Code requires that public buildings which are built in Clackamas County include Radon Control Methods. Previously permitted projects for CCC have not required this, and it is unclear why. Further code investigation will be done at the start of Design Development, but at this time Radon Control Methods have been excluded from the scope of work.

DROP TOWER

The committee discussed including a drop tower in the new building. However, square footage has been exceeded and it is recommended that we wait to add this new program until receipt of the cost estimate.

PROGRAM ACCOUNTING

The graphic below is a comparison of square footage requirements estimated during the programming phase, and square footages as tallied in the final schematic design set.

Room Name	SF (anticipated)	SF (actual)	Notes
Biology Lab	1,500	1,462	
Student Projects Space	350	367	
Biology / Environmental Lab	1,260	1,285	
Biology Lab Prep and Storage	945	1050	
A&P / Zoology Lab	1,500	1,441	
A&P Storage	475	499	Includes Animal Room and Cold Storage
A&P Study Room	0	268	
Shared Lab Preparer Office	100	92	
Chemistry Lab #1	1,500	1,453	
Chemistry Tutoring Lab	1,650	1,890	
Chemistry Lab Prep	504	621	
Chemical Storage	233	302	
Chemistry Instrumentation Lab	315	163	
Lab Preparer Office	100	135	
WET and Chemistry Lab	1,500	1,453	
WET Instrumentation Lab	475	304	
Classroom	940	940	Located in Existing Dejardin
Drop Tower	0	0	
Full Time Faculty Offices	1,600	2,672	Located in Existing Dejardin
Part Time Faculty Offices	1,000	765	Required SF was adjusted during SD
Staff Offices	200	100	Remaining SF shown in Kits Room
Kits Room	100	329	
Student Study Space	1,000	907	
Total NET square footage	17,247	18,498	
Total GROSS square footage of new building	**19,769**	**22,500**	

2 CIVIL NARRATIVE

TOPOGRAPHY

The project site is relatively flat with subtle slopes on the order of 1 to 2 percent throughout the existing parking lot. Some surface ponding is observed on the asphalt after rain events. The grades fall steadily to the south and west of DeJardin Hall.

NATIVE SOILS

According to the Natural Resource Conservation Service, the site soils are Bornstedt Silt Loams with fine textured soils. The soil's hydrologic group is class "C", with a relatively low hydraulic conductivity. The geotechnical site investigation by GRI confirmed these conditions. One of the field borings encountered refusal, suggesting the presence of cobble or a boulder which have been found throughout the campus. These native soil types typically have a very low permeability and a high runoff potential.

UTILITIES

Our understanding of the existing utilities is based on site survey mapping prepared by Northwest Surveying, Inc. and as-built record information provided by Clackamas Community College gathered during the campus master plan update efforts. There are currently no known deficiencies with the infrastructure to meet demands.

WATER

The existing water distribution system on campus is a private system, served from two large master meter connections to the public water system. The site appears to be well served by the existing adjacent water main west of the proposed building. The proposed building footprint will require the relocation of this water main and an existing water service loop that serves the existing DeJardin Hall, including a hydrant and fire department connections.

The existing fire service for DeJardin Hall will be maintained, and the sprinkler system will be extended internally to serve the new addition. No new fire service will be required for the addition. The existing FDC will have to be relocated in coordination with the new fire hydrant along the new drive in front of the addition.

A new domestic water service will be provided for the addition off the relocated water main.

The CCC had their water system tested in 2003 to verify flow capacity for future development. The results from the study are summarized in the Water Distribution System Testing and Analysis report dated, March 3 2003 by Dee Lockwood, PE. The approximate static pressure available near the project site is 70 psi. However, a significant system improvement was recently completed with the ITC & Barlow Parking Lot projects where approximately 900 lf of 6" water main was replaced with 8" diameter pipe.

This improvement should enhance the capacity of the distribution system. Although this does not change the available static pressure, and a new flow test should be completed on a nearby hydrant to inform the design and to document availability of fire flows for City review.

SANITARY SEWER

There is an existing gravity sewer serving the DeJardin Hall. The proposed addition will be located above this existing sanitary sewer lateral flowing to the main. This service lateral will either need to be rerouted around the addition, or be picked up and conveyed in the new plumbing system to maintain a similar connection point to the sewer main at the west end of the addition.

STORM WATER

Surface runoff from the newly improved impervious areas will be managed in accordance with the Oregon City Stormwater and Grading Design Standards. Drainage from all new and improved impervious surfaces must be routed through storm facilities that provide water quality treatment and flow control.

The storm facility that serves the current DeJardin site to the east of the existing building will be maintained, and runoff from the ~15,000 sf of new building addition and associated plazas will be managed in a different facility. Roof areas from the addition and new plaza paving will need to be collected and conveyed to a storm facility. The current schematic design will locate a vegetated storm facility to the south of the addition. The sizing of the facility will be approximately 14% of the contributing impervious area, or about 2,100 sf, although a smaller area is currently illustrated on the plans.

There is a potential to integrate site drainage from the DeJardin Hall Addition with the Transit Center and parking lot improvements. This could eliminate the storm facility on the south side of the addition, but would require additional capacity in a downstream facility serving the parking lot. The design of those improvements is still under development and more effort is needed to verify compatibility with that approach.

There is an existing storm main flowing west that passes south of DeJardin Hall is part of the Caufield Basin that discharges at the southwest corner of campus. The proposed improvements will require a portion of the existing storm main to be rerouted around the south side of the addition. Existing laterals serving Rook Hall and Pauling Science Center to the north of DeJardin will also need to be relocated and routed south between the existing and new addition to reconnect to the storm main. This will have to be coordinated with the foundation plan to mitigate conflicts.

3 LANDSCAPE NARRATIVE

SITE DESIGN

The site design for CCC's DeJardin Science Addition aims to celebrate the building program with "Science on Display" components. The design also strives to balance the programmatic site improvements with the existing site conditions and campus maintenance. With many existing and proposed connections to the new DeJardin addition, including new connections from the Transit center, this new building will create a hub of activity within the Science Complex. Working in unison with the surrounding campus, the site welcomes students and visitors by providing opportunities for social interaction with the design of a main concrete entry plaza, while integrating the existing campus circulation.

LANDSCAPE

The proposed landscape and planting design will meet Oregon City code requirements. Plant material will be selected from City and client approved plant lists. Species will be selected for site appropriate locations to provide screening as needed, maintain safe site views and to perform within site specific micro climates, such as shade or sun exposed areas. Storm water facilities are integral to the site design and will store and treat surface and roof run-off..

The site landscape plantings are grouped into three themed zones based on the Pacific NW ecoregions; the Eastern Cascade Slope and Foothills zone, the Cascades zone, and the Willamette Valley zone. The majority of plants will be native and climate-adaptive plantings which are drought tolerant requiring limited maintenance. The suggested plant material will be compliant with local agencies and in reference to the current campus approved species list. All plants will be irrigated using a spray irrigation system, with the exception of trees which will be irrigated with bubblers.

Plantings adjacent to the building will include shrubs and groundcover as well as water quality plantings. Deciduous and coniferous trees are selected in key areas based on form and planting typology zone. Small flowering trees will be selected near the main entry plaza to provide seasonal interest, and are smaller in scale to highlight the building entry, not obstruct it. Turf will be proposed to the south of the addition where the existing parking lot is today. The existing trees next to Douglas loop will be preserved.

MAIN ENTRY PLAZA (DNA PLAZA)

The main building entrance to the DeJardin addition features a saw-cut concrete entry plaza on the northeastern façade of the addition. This space is the hub for circulation as it connects the primary pedestrian circulation routes from the north and east. The shape and design of the plaza's linear forms are inspired by the DNA ladder, which highlights one of the Science on Display features in the site design. Cut boulders are the primary material suggested for seating in the plaza. The design intent is to compliment and reuse materials that are found within the CCC campus. The current design proposes 3 unique boulder seating niches, as shown in the plan. The large glacial erratic boulder will also be placed in this entry plaza with its associated plaque. These boulder features will be unique to the Science building, and iconic to the main entry landscape.

4 STRUCTURAL NARRATIVE

GENERAL CONFIGURATION

The Clackamas Community College DeJardin Hall Addition is relatively rectangular in plan, with overall dimension of approximately 100' x 120'. The two-story structure will include classrooms and general lab space.

An intermediate atrium space divides the northern and southern classroom spaces. The atrium at L2 consists of a continuous corridor along the southern section of classrooms, with periodic catwalks between the stair and lobby openings in the diaphragm. The catwalks connect the corridor to the northern portion of classrooms. Three monitor skylights occur above the atrium catwalk and corridors.

GRAVITY SYSTEM

FLOOR GRAVITY SYSTEM

The floor gravity system consists of conventional steel wide flange beams framing to wide flange girders supported by wide-flange or HSS columns. The floor system is comprised of 3" 20 gage metal deck and 3" of normal weight concrete fill. The floor assembly assumes a fire rating is not required. An additional ½" of concrete topping may be added to achieve a 1-hour fire rating. The typical ~30'x25' bay spacing results in framing members spaced at approximately 8'-0" o.c. For this span, the 20-gage metal deck material will not require shoring during construction.

We expect the typical interior beams to be W24 members, which frame into W27 girders. Perimeter framing supporting brick veneer are 27" wide-flange framing.

To allow for additional clearance for mechanical systems located in the corridor between grids 3A and 3A.3, the slab on metal deck will span the 7'-6" span without support of beams below. For this span length, the 20-gage metal deck will not require shoring during construction. If it is determined that this additional clearance is not required, the columns on grid 3A.3 may be removed, and the beams between grid 3A.3 and 4A shall extend to grid 3A. In this circumstance, the beams will increase from W21 to W24 members.

The gravity floor framing system utilizes composite action with shear studs at uniform spacing to help control deflections and reduce overall steel tonnage. The typical spacing of shear connectors is 1' 0" on center, occasionally, there will be more than one stud located at this spacing. The concrete slab on metal deck is reinforced with conventional #4 reinforcing bar at 12" on center each way. This will increase to #4 reinforcing bars at 9" o.c. if the finished floor is to be a polished product.

ROOF GRAVITY SYSTEM

The typical roof framing system consists of conventional steel wide flange beams framing to wide flange girders supported by wide-flange of HSS columns. We expect the typical roof beams to be W16 members and the girders to be W21. Roof beams and girders below the mechanical units, particularly below mechanical AHU's, may approach W21 and W27 members, respectively. The typical roof system consists of 3" 20 gage metal deck and 3" of normal weight concrete fill. A rated assembly is not required at the roof. The typical roof framing system utilizes composite action with shear studs at uniform spacing with the same specification as for the floors.

SEISMIC DESIGN CRITERIA

The governing code is the 2014 Oregon Structural Specialty Code (OSSC). The linear static procedure will be performed on the structure in accordance with the requirements of the OSSC. The current direction of the occupancy and use of the structure indicate that it will be classified as Risk Category III and designed with a seismic importance factor of 1.25.

LATERAL SYSTEM

This building will be interconnected to the existing DeJardin Hall at the interface between grids BB and CB. A 3" seismic separation shall occur between the existing building and new addition. This will require the partial demolition of the existing exterior framing and veneer, along with the existing entry canopy.

Due to the large openings at the L2 atrium and monitors at the roof, there is limited diaphragm connectivity between the northern and southern classroom sections. The primary lateral system for each building section will consist of steel buckling restrained braced frames. Braced frames extend from the foundation to the roof. We expect the typical brace steel core to have an area of 4 in2 with an outer casing that is 10" square.

FOUNDATION SYSTEM

The foundation system will likely consist of conventional spread footings at columns and strip footings at braced frames. The ground floor slab will be a reinforced concrete slab on grade, most likely 5" or 6" thick and reinforced with conventional #4 or #5 reinforcing steel at 16" on center each way. This will increase to reinforcing bars at 12" o.c. if the finished slab is to be a polished product.

ESTIMATE OF STEEL TONNAGE

For cost estimate purposes, an average tonnage of steel of 13.5 pounds per square foot of elevated floor framing may be used. This estimate includes all the steel beams, girders, columns, shear tabs, connection plates, gusset plates, and all miscellaneous steel in the structure. The miscellaneous steel includes out of plane support for curtain walls and the entry canopies. It does not include miscellaneous metals such as stairs, hand rails, guardrails, or braced frame braces.

STORY HEIGHTS

The story heights are expected to be 14'-8" at L1 and L2.

EXTERIOR FRAMING AND VENEER

The exterior skin of the building will be brick veneer with 6" light gage metal framing providing structural backup. These studs will span from top of slab and attach to the underside of slab edge with clips that allow for both vertical deflection and lateral drift. If the final height of the structure and parapet exceed 30'-0", the veneer will require a relief angle at the roof slab edge. Otherwise, the veneer may be stacked from the foundation to eliminate the need for intermediate relief joints.

BUILDING DESIGN SUMMARY

A summary of the building design requirements and preliminary design features are as follows:

STRUCTURAL DESIGN CRITERIA

- 2014 Oregon Structural Specialty Code (2014 OSSC)
- Gravity, wind, and seismic loads will be developed using the 2014 OSSC and ASCE 7-10 as applicable.
- AISC Steel Construction Manual (14th Edition)
- AISC Seismic Design Manual (2nd Edition)

DESIGN LOADINGS & TYPICAL LIVE LOADS

- Typical Floor Loading 81 psf
- Corridors, Exits, Stairs 100 psf
- Storage Loading 125 psf
- Roof 25 psf Snow + Drift

WIND LOADS

- 130 MPH per OSSC
- Wind Importance Factor, Iw = 1.0

SEISMIC LOADS

- Site Class D
- Risk Category III
- Seismic Design Category D
- Seismic Importance Factor, Ie = 1.25
- Site Specific Design Criteria to be Determined Once Geotechnical Data is Available
- R=8 for Steel Buckling Restrained Braced Frames (BRB)
- Overstrength Factor, Ω = 2.5
- Displacement Amplification Factor, Cd = 5

FOUNDATION DESIGN CRITERIA

- Geotechnical Information is currently being finalized. Based upon the draft report provided by GRI, the allowable soil bearing pressure is 3,000 psf with a 1/3 increase for short-term seismic and wind loading. Additional geotechnical design criteria will be updated once the report is finalized.

MATERIALS

- Concrete for Foundations, Slabs, and Toppings – 4000 psi
- Reinforcing Steel – ASTM A615 Grade 60
- Structural Wide Flange Framing - ASTM A992
- Structural HSS Framing – ASTM A500 Grade B
- Plates and Miscellaneous – ASTM A36

5 PLUMBING AND FIRE PROTECTION

PLUMBING

The domestic water system will be served from a new service to the building, into and including the building systems. This will include meter, backflow prevention and pressure regulation devices as necessary.

The domestic water piping will be copper with brazed joints below grade and soldered joints above grade.

The sanitary waste system will be a new service within the building. The waste and vent piping system will be no-hub cast iron with heavy duty couplings below grade and no-hub cast iron with standard duty couplings above grade.

The storm drainage system will be a new service within the building. The piping system will be no-hub cast iron with heavy duty couplings below grade and no-hub cast iron with standard duty couplings above grade. The piping will be extended to the roof drains and downspouts. Overflow roof drainage will be piped to daylight above grade.

The plumbing fixtures will be ADA compliant as appropriate for the designated locations.

The plumbing fixtures will be water conserving within the parameters of governing code standards.

The domestic hot water will be provided by a central condensing water heater with circulation. The system will be provided with an ASSE 1017 master mixing assembly. The circulated hot water system will then be segregated into two system.

- Potable water to serve standard use fixtures.
- Industrial hot water (and cold water) with code compliant Reduced Pressure Principle Backflow Preventers (RPBP).

Hose bibbs will be provided at approximately 100-foot intervals at ground level exterior of entire building. As well, hose bibbs will be provided at roof hatch/access areas.

In applicable mechanical/plumbing equipment areas, Emergency shut-off systems will be provided for shut-down of the fuel gas system in the room via a switch at the exit doors. This in compliance with ASME – CSD standards.

The building will be provided with utility gas meter set and piping extended to all fuel gas fired equipment/devices.

Condensate drains will be provided at all HVAC cooling units.

At all fuel gas fired condensing equipment, combustion condensate drains (utilizing chemical resistant piping) will be provided and routed thru neutralizers and then to sanitary drain receptors.

Make-up water with code approved backflow prevention devices will be provided to Mechanical equipment etc.

SCIENCE/LAB AREA SYSTEMS AND STRATEGIES

In applicable science areas, Emergency safety equipment (showers/eyewashes etc.) will be provided with tempered water systems as outlined by ANSI.

A tepid water system will be provided to supply drench hoses and safety shower/ emergency eyewash fixtures with potable water at tempered temperature and distributed in a separate loop to each floor.

PURIFIED (D.I.) WATER:

Option 1: A central purified water system (D.I.) is to be provided with full circulation is to be provided to the Lab Prep rooms.
Option 2: A central purified water system (D.I.) is to be provided with full circulation is to be provided to the Lab Prep rooms and the Lab rooms.
Option 3: Point of use purified water system (D.I.) are to be provided in each area of purified water use listed in the Lab services Matrix.
The level of purification is to satisfy ASTM Type II specifications including minimum resistivity of 1 meg-ohm-cm.

Each floor is to be provided with a piping distribution system independent of other floors. The distribution should be a continuous loop of undiminished pipe size routed to each service location. The branch connection to the service fixture is to have a local isolation valve located to minimize the dead-leg.

LABORATORY COMPRESSED AIR (LA)

Oil-free and dried instrument grade compressed air, ISO 8573.1 class 2.2.1 quality is to be supplied through floor distribution piping at 100 psig. Pressure reducing valves are to be provided downstream of the laboratory point of connection for delivering laboratory compressed air (LA) at 15 – 30 psig to services.

LABORATORY VACUUM (LV)

Laboratories will be provided with a centralized vacuum system. The system will provide 19 to 23 inch Hg negative pressure at the most remote location of vacuum service. The system will be duplex vacuum pumps, storage tank, controls, and distribution piping.

LABORATORY NATURAL GAS (LG)

Natural gas will be supplied at low pressure of 4 to 7 inches of water. Each floor and laboratory space is to have an isolation valve that is quickly accessible for emergency shutoff. Additional shutoff valves should be provided downstream of the point of connection in accessible locations for controlling the usage of natural gas in teaching laboratories. In applicable science areas, keyed fuel gas control systems will be provided including Emergency shut-off systems which will be provided with shut-down switches at the exit doors and control stations for the instructors.

LABORATORY WASTE SYSTEM (LW)

The facility will be provided with chemical resistant waste and vent system. Laboratory waste and vent systems will be separate from the general use sanitary system. The two systems will be connected to the site sanitary waste system outside the building footprint.

SUSTAINABLE STRATEGIES

Ultra-low-flow water conserving fixtures will be utilized as well as sensors on lavatories and urinals.

Thermal solar water heating will be reviewed for viability and cost valuation.

EXISTING BUILDING

In the existing portion of DeJardin Hall, a new sink will be added in the first floor Online Learning room and will tie in to the existing nearby 6" waste line and domestic hot & cold water lines.

FIRE PROTECTION

FIRE SPRINKLERS

The new expansion will be protected with a wet pipe system per NFPA 13, local building codes and fire marshal requirements. Areas subject to freezing, such as overhangs, canopies and unconditioned spaces, will be protected with a dry pipe system or dry sprinklers. Sprinklers, valves, switches, pipe, fittings, hangers, branch line restraints, sway braces and the like will be UL listed. Quick response sprinklers will be provided in Light Hazard areas.

Piping will be concealed where possible.

The existing sprinkler riser equipment and system piping will be extended from the existing DeJardin Hall using a four inch main to provide the hydraulic requirements for the new sprinkler system. The existing fire alarm equipment serving the existing sprinkler system will also monitor the new sprinkler system.

Piping will be schedule 40 black steel for piping 2 inches and smaller and schedule 10 black steel for piping 2-1/2 inches and larger.

Sprinklers for the new expansion will match the existing sprinkler style, finish, and aesthetic preferences.

The existing fire department connection will also provide for the new sprinkler system.

FIRE STANDPIPES

Standpipes are not required for this project. Standpipes are required if the highest floor level is more than 30 feet above the lowest level of fire department access.

FIRE PUMP

A fire booster pump will not be required. The new sprinkler system will be supplied by the existing underground connection into the building.

EXISTING BUILDING

In the existing portion of DeJardin Hall, sprinkler head locations will be modified to accommodate the new floor plan.

6 MECHANICAL

HEATING, VENTILATING, AND AIR CONDITIONING

HEATING SOURCE

Two 500,000 BTU/h high efficiency, condensing boilers (basis of design: Aerco or equal) will serve all air handling unit and supply air valve heating coils as well as hydronic baseboard heaters. The heating loop will be designed for 100°F return water and 140°F supply with reset based on zone demand. Two-way control valves with a bypass valve to maintain minimum flow will be utilized, and type L copper piping and AL 29-4C venting is anticipated.

As an option, a radiant floor slab will be utilized in the Commons area for heating and cooling, and it will be served by the heating water and chilled water systems.

COOLING SOURCE

Cooling is provided by a 50-ton air-cooled, scroll chiller (four compressors), and air handling units served by this chiller will provide cooling for all areas. At night, AHU-2 will bring in cool, unconditioned outside air to flush out the Commons area and pre-cool the building mass to delay temperature swings the following day.

As an option, a radiant floor slab will be utilized in the Commons for heating and cooling, and it will be served by the heating water and chilled water systems.

AIR DISTRIBUTION

The two main air handling units (AHU-1 & 2) are roof-mounted, and AHU-1 will supply the variable air volume system that serves the lab and classroom spaces using medium pressure supply ducts routed through vertical chases in the building, while AHU-2 will serve the central Commons area. These units will have the following supply airflows: AHU-1: 23,000 cfm, AHU-2: 5,000 cfm. AHU-1 will have a heat recovery run around loop coil connected to the central lab exhaust fan EF-1, and each of these units will also have chilled & heating water coils, VFDs, and MERV 8 & 13 filters. The basis of design manufacturer is Haakon for AHU-1 and Aaon for AHU-2, or approved.

Overhead air distribution will be used in the building with ceiling-mounted supply diffusers and linear slot diffusers at the perimeter areas, and ceiling mounted return grilles will be ducted to the central lab exhaust fan EF-1. Supply air valves (Phoenix) with heating water coils will be utilized in all spaces served by AHU-1.

A roof mounted, variable flow, 23,000 cfm high plume exhaust fan will serve the lab areas and fume hoods in the building, and it will include a run around heat recovery coil that transfers energy to AHU-1 which is a 100% outside air unit. Exhaust air valves (Phoenix) will be utilized for fume hoods and general room exhaust, and all exhaust ductwork associated with this fan will be stainless steel due to the corrosive nature of the exhaust air.

In the central Commons space, a natural ventilation system will utilize low intake louvers (with low leakage motorized dampers) on the first floor as inlets, and it will use a relief hood with a supplemental exhaust fan on the roof. A bio-wall using plants as filtration for the outdoor intake air will be analyzed for use with the natural ventilation system.

CONTROLS

An Automated Logic (Clima-Tech) direct digital control (DDC) system will serve this building, and it will be tied into the existing control system interface at the CCC Facilities Department.

SUSTAINABLE STRATEGIES

The following are energy efficiency/ sustainable strategies will be analyzed for consideration by the design team and CCC for implementation:

- CO2 sensors for high occupancy areas.
- Radiant heating & cooling in the Commons area.
- Natural ventilation in the Commons area with a bio-wall for outdoor air filtration.
- Cascading make-up air for lab areas.
- Heat recovery from the lab area exhaust fan.
- Various HVAC control optimization strategies, including night-time building flush and supply air temperature reset.
- Premium efficiency motors.
- Using a demonstration rainwater harvesting system as a non-potable water source for toilet flushing.

EXISTING BUILDING

In the existing portion of DeJardin Hall, minor HVAC modifications will be made to accommodate the new floor plan, including adjusting the duct routing, relocating grilles & diffusers, and adding new terminal units to serve the new office spaces.

7 ELECTRICAL

INTRODUCTION

The intent of this design narrative is to present an overview of the electrical systems for the expansion of DeJardin Hall at Clackamas Community College's main campus in Oregon City.

CODE ANALYSIS

The electrical systems will be designed in accordance with the following codes and standards as adopted and/or amended by the State of Oregon and Oregon City. If conflicts between State and City codes and College Standards arise, the more stringent requirement will be followed unless directed by the College.

APPLICABLE CODES

NFPA 70 National Electrical Code (NEC) – 2017 edition
NFPA 72 National Fire Alarm Code – 2013 edition
NFPA 110 Standard for Emergency And Standby Power Systems – 2013 edition
OSSC Oregon Structural Specialty Code – 2014 edition
OFC Oregon Fire Code – 2014 edition
OESC Oregon Electrical Specialty Code – 2014 edition

ELECTRIC SERVICE

NORMAL POWER – EXISTING CAMPUS DISTRIBUTION

The existing DeJarding building is presently supported from an adjacent building, Roger Rook. The main electrical room in the DeJardin building houses the 600A, 480V/3P distribution board (4MDPB). Demand records provided by the College indicate this distribution board and the distribution system in Roger Rook has historically been lightly loaded. As such, it is our initial recommendation to feed the new expansion by providing a new 400A circuit breaker in available space in 4MDPB the existing distribution board in DeJardin 1.

- 4MDPB peak demand over the previous 12 months = 90.91 kW
- 4MDPB distribution board capacity = 600 amps
- % utilization = 19%

The main feeder from Roger Rook to DeJardin may be impeded by the new expansion's footprint. As such, this feeder will need to be relocated to avoid running below the expansion. This feeder relocation will impact operation of the existing DeJardin facility and will need to be completed during non-standard work hours.

It is expected the existing 12.5kV transformer and vault that serve the Roger Rook building will need to be relocated due to the grade changes in the area and the Transit Center project. The costs associated with this work are planned to be addressed in the Transit Center project.

NORMAL POWER – BUILDING DISTRIBUTION DESIGN BASIS

Presently, the metered demand on the building is 90.91kW. The initial calculated demand load for the expansion is 367kVA. The new distribution board will be housed within the main electrical room of the expansion. There is an additional electrical closet located to help minimize the effect of voltage drop.

The power density for the expansion is 20 watts per sq.ft. with 15 watts per sq. ft. of 120 volt power dedicated to the lab spaces for lab equipment.

A single dry-type, premium efficiency transformer, complying with 2016 Department of Energy efficiency requirements, will be located in the first floor electrical room in the facility to step down from 480/277V to 208/120V. NEMA TP-1 efficiency levels are no longer acceptable.

Each lab will have a dedicated 225A panelboard with a 150A main circuit breaker to serve loads within that lab space, with the exception of the laboratory lighting. Each floor will also have house panels to serve non-laboratory related loads as well as the non-emergency mechanical equipment.

There is no PV system planned as part of this project.

In general, branch wiring systems will be in accordance with NFPA 70. All branch circuits will utilize dedicated neutral conductors. All branch circuits shall utilize an equipment grounding conductor. Typical branch circuit wiring will be minimum #12 AWG Cu, installed in EMT conduit, for power and lighting systems and PVC over-jacketed twisted pair for systems. Limited use of MC cable will be allowed within interior walls for branch circuit wiring. Rigid threaded type

conduits shall be used for all exposed runs where subject to mechanical injury as defined by NFPA 70 and the local electrical inspection authority. Conduit to be installed concealed except in mechanical rooms, electrical rooms and other unfinished areas, as well as across the atrium space. Empty conduit will be installed with a pull wire inside.

All panelboard feeders shall be copper run in conduit. All electrical equipment shall be bonded with a dedicated ground conductor.

In general, location, quantity and type of wiring devices will be in accordance with NFPA 70, the Oregon Administrative Rules (OAR), and College standards.

Receptacles will be commercial grade and have a minimum rating of 15 Amps. Line voltage switches will be commercial grade, with stainless steel cover plates in all finished areas. Where surface-mounted or in unfinished areas, devices to be mounted in 4" square outlet box with matching covers. Special receptacles to be twist-lock, or straight blade, 2-pole, 3-pole, 208/120V.

Faceplates of receptacles and switches shall include a label with associated panel name and circuit number.

Convenience receptacles for general maintenance and cleaning purposes to be provided in the following locations:

- 50' on center in circulation corridors.
- Within 15' of any mechanical equipment.

All HVAC equipment will be served at 480 volts, 3-phase for motors ½ horsepower and up. Smaller loads will be served either at 208 volts or 120 volts. Division 26 will provide disconnects and motor starters in all cases except where Variable Frequency Drives (VFD) are specified by Division 23.

It is recommended that a building wide short circuit and arc flash evaluation/study be performed. The costs of the studies and the generation and installation of new arc flash labels to all existing and new equipment needs to be factored into the overall project's budget as well as the costs of gathering information on all feeder lengths, wire size, and overcurrent protective device ratings/ settings to aid in the preparation of the study.

Existing underground exterior lighting branch circuits may require relocation to accommodate the new building footprint. The extent of the relocation effort will be further explored in Design Development.

BACKUP POWER – CAMPUS DISTRIBUTION SCOPE OF WORK

At this time, the generator previously supporting the existing DeJardin building is out of commission due to a fire. It is the College's intent to replace this generator with a new diesel generator as part of another project. Initial thoughts will be to size the new generator to be able to serve multiple buildings in the vicinity – Roger Rook, Pauling and DeJardin, as well as the expansion. This will partially be determined as a part of the College's generator master plan effort this is scheduled to be initiated in late August. The exact duration of the master plan effort has not been determined at this time, but it is understood the new generator plant must be operational to support the DeJardin Expansion project. The location of the new generator has yet to be decided.

The new generator will feed (2) Automatic Transfer Switch (ATS) – one for the emergency branch and one for the optional standby branch. There is an existing egress lighting panel (E4B1) in DeJardin that has space capacity and spare breakers. This is a 125A MLO panel being fed from a 30A ATS. This ATS will be re-fed from the new generator. This panel would then feed the egress lighting in the expansion. The optional standby ATS would be housed in the expansion's electrical room and feed the recommended HVAC loads, the new IDF on the second floor of the expansion, as well as any other equipment deemed essential by the College.

As an additive alternate, re-feeding the existing branch circuits in the existing DeJardin IDF with standby power from the new optional standby ATS.

TABLE 1 - LIGHTING LEVELS

AREA	FC-GENERAL	FC - TASK
LABS	50	75 (BENCH/DESK)
OFFICE/WORK AREAS	40	75
CORRIDORS	15 - 20	N/A
STORAGE AND EQUIPMENT ROOMS	20	N/A

LIGHTING

Luminaires will utilize LED technology throughout, for maximum efficacy and efficiency, as well as ease of maintenance. Light levels will be designed to meet the recommendations of the Illumination Engineering Society. These recommendations are reflected in Table 1 - Lighting Levels.

Local control of the luminaires will be provided in each room. Enclosed rooms will be automatically controlled via occupancy sensors and will include a manual override switch. Dual-technology sensors will be utilized as most appropriate for the application. Combined wall mounted occupancy sensor switches will be used for small rooms. Daylight harvesting dimming control will be utilized in all energy code required spaces with natural daylight exposure. This system will be automatic and not require any user input once commissioned.

Luminaires in corridors and other core areas will be controlled via a lighting control panel. The existing DeJardin building houses a PCI lighting control panel. This project will replace this control system with a new BlueRidge lighting control solution. This control panel will not only provide control of the corridors and core areas of the expansion, but will also be used to upgrade the controls for the existing building. The full extent of the upgrade and determining whether or not local devices in the existing portion will need to be swapped out in order to be able to interface with the new BlueRidge panel will be determined as the Design Development phase progresses. It is expected that field devices with no intelligence (i.e.: line voltage light switches, low voltage toggle switches, etc.) will not require replacement as part of this upgrade, and that devices such as room controllers located in each classroom or lab will require replacement.

Luminaires in laboratories are planned to be controlled by dual-technology occupancy sensors.

Egress lighting will be provided via the back-up generator. In addition to code required emergency lighting, at least one luminaire in each public restroom will be on emergency power.

It has been requested that the existing lighting in the existing building be swapped out for the more energy efficient LED luminaires. This update is to be priced out as an additive alternatefor the College to review.

TECHNOLOGY

A new IDF room will be provided. The room is required to be no smaller than 10ft. x 12ft.

The current intent is to provide a minimum of (2), two-post, 7-feet high by 19-inches wide, standalone equipment racks to support backbone and horizontal cable installation and installation of Owner-provided network equipment. The racks will be provided with (1) 6-inch wide vertical wire manager on each end and in between each rack. An appropriate number of patch panels will be provided to serve the floor.

For design purposes, each rack is assumed to have 4kW of electrical load. Further discussions with the College will be required to determine the actual loading.

The DeJardin building is being served by multimode fiber. The new campus standard is singlemode fiber. Since the existing fiber connection currently runs below the new building footprint and thus the conduit pathways will need to be relocated, the intent is to remove the existing multimode fiber and replace it with singlemode. The new fiber will run in the existing pathway from Barlow Hall to the existing MDF. It is expected the existing vault adjacent to the Roger Rook building will need to be relocated as well to accommodate grade changes in that area. The existing diamond-plate cover will need to be removed and a vehicular rated manhole will need to be installed.

With this done, the new fiber-optic backbone cable infrastructure will be extended to the new expansion IDF (assumed to be 4 strands of singlemode fiber) from the existing MDF. The fiber-optic cable will terminate in a rack-mounted, fiber-optic distribution unit.

The fiber-optic cable will be run in a 1-inch innerduct within two new 2in. conduits. 12 inch cable tray will be provided for structured cable distribution.

The new spaces will be cabled with Category 6A voice and data network cabling per College standards, to be confirmed with the Engineering team. Wall mounted outlets will be served by a two-gang conduit back box, one-gang mud ring, four port faceplate and conduit that stubs up to the nearest accessible ceiling. These outlets include:

- Mass Notification speaker outlets – 1 Category 6A cable
- Copy/Printer outlets – 2 Category 6A cables
- Wall Phone outlets – 1 Category 6A cable
- Building Management System Outlets – 2 Category 6A cables
- Workstation outlets – 2 Category 6A cables
- Computer lab outlets – 1 Category 6A cable per computer
- General outlets – 4 Category 6A cables

The IDF will be provided with a ground bus bar connected to the existing building's main telecommunications ground bus bar at the main telecom room.

Pathway and cabling infrastructure will be provided for active AV equipment, with locations and cabling types to be determined. Currently the meeting room would be the only room possibly needing AV. Active AV equipment to be provided by the Owner.

ELECTRONIC SECURITY

Access Control and video surveillance requirements have not yet been coordinated with the College. These systems will be fleshed out during the Design Development phase. It is assumed the building will have electronic card access and door hardware at all exterior doors to control and monitor building access. The building will also be lockdown capable.

In order to enhance student and faculty safety as well as to protect equipment, it is also assumed cameras will be placed in order to cover all exterior exits, building corridors and stairwells. The video surveillance system will tie into the campus' existing video management system.

The access control system will be connected to the campus wide electronic security system. No modifications or upgrades to the existing building are planned at this time.

FIRE ALARM

The expansion of the DeJardin building will necessitate expansion of the current Johnson Controls fire alarm system to meet national, state and local standards. Automatic smoke detection will be provided at electrical, telecom and mechanical rooms for activation of fire safety functions. Audible and/or visible alarm appliances will be provided throughout the renovated spaces.

Fire alarm wiring is not required to be in conduit. Fire alarm devices shall be labeled as such and be red in color from the Manufacturer. Painting devices red is not allowed.

MASS NOTIFICATION

It is expected to have a mass notification system deployed throughout this facility. The active electronics and field devices to support this system will be provided by the Owner, while this project will provide power and structured cabling to support this system.

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