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Upon confirmation of the vision for the new community centre, the room by room program was developed through an iterative process with City Staff. The rooms are summarized in the table below. The detailed space requirements follow under the separate section "Room Data Sheets".

<b>Room Type</b>	<b>Key Ideas, Uses</b>	<b>Adjacency</b>	<b>Area</b>
"Village Square" Sports Hall	Active gathering space, flexible, "Garage" concept Ample connection to the exterior Ground level connection for hosting activities such as markets, exhibitions, trade shows, etc. that can spill outside of the facility Sized for physical activity, sports Sprung wood floor May or may not have sport court lines – exploration of current technology to provide this functionality is required Folding wall to divide space into two separate rooms Inclusive	Exterior Green Space Multipurpose Room Kitchen	6,500 s.f.
	"Village Square" Storage		600 s.f.
Activity Track	Indoor 2-Lane Running Track within "Village Square" for walking during months of rainy weather or for short track training 4' wide lanes Elevated within the Village Square enclosure	Village Square	2800 s.f.
Multipurpose Room 1	Connectivity to one side of the "Village Square" for use as a green room to support performances or demonstrations Alternate use as a breakout room or multipurpose room	Village Square	1500 s.f.
	Multipurpose Room Storage		150 s.f.
Multipurpose Room 2	Flexible space to support all types of programs	Multipurpose 1	1500 s.f.
	Multipurpose Room Storage		150 s.f.
Multipurpose Room 3/ Meeting Room	Size suited for use as a meeting room, flexible space for uses other than meetings		600 s.f.
Active Studio	Dance classes, wellness programs, sprung wood floor; extra high ceiling for creative dance		2000 s.f.
	Active Studio Storage		200 s.f.
Wet Art Room	Arts Education for multi-generations Dedicated room that creates awareness and brings arts community into a community facility		1100 s.f.



Room Type	Key Ideas, Uses	Adjacency	Area
Public Exterior Plaza	Water, gas, electricity. This is a space that will be activated and that should connect inside and outside. Ideally is seen to have garage type or doors that open to the interior creating a fluid and continuous space.		
Feature Stairs	Stairs should be front and centre, encourage people to use them		
<b>Total Area</b>			<b>32000 s.f.</b>



## Specifications and Interior Finishes

Minimum base building requirements, reference finishes specifications, as well as detailed room data sheets are provided below for the Community Centre to provide direction and outline base expectations for the design, development, and construction of the facility. It is understood that as the design is evolved that every effort will be made to design and construct a facility that represents best practices in the development of recreation facilities. As such, construction methods, systems and finishes will be chosen that meet the design principles outlined both in this document and the full program document titled “City Centre Community Centre North,” dated August 30, 2016, though they may vary from the specifications provided should a more appropriate solution be identified. The City will sign off on all finishes and systems prior to construction.

## Minimum Base Building Requirements & Facility Wide Infrastructure

### Stand-alone facility

The community centre facility shall be constructed as independent from the rest of the YuanHeng development. The intent of the separation is to allow the facility to function as a stand-alone facility (exclusive of uses contained within the parking structure). Mechanical, electrical, communications, life safety and security system shall all be independent and thereby allow for energy and usage monitoring of the community centre and maintenance of systems without affecting other areas of the development and vice versa. This will also allow the City to have control of the systems.

In addition, no systems or their components which are not for the sole use of the community centre (exclusive of uses contained within the parking structure) shall be physically located within the community centre footprint.

### Parking

A total of 52 dedicated parking stalls are to be provided by the Developer for use by the Community Centre 24 hrs per day, seven days per week, plus 2 loading/parking spaces for the exclusive use of the City for program and other community centre vehicles. In addition, a total of 20 spaces will be available for shared use between the office spaces and the Community Centre. The City will be permitted to designate the use of the spaces (e.g., staff, families, pick-up/drop-off) as it sees fit and the rate charged for use of these spaces by the owner shall be to the City's satisfaction.

The parking spaces shall be reasonably located in proximity to direct access point(s) to the Community Centre.

A drop-off zone close to the front entrance of the facility will be provided to facilitate access by those with limited mobility.

### LEED Performance

The project shall achieve LEED Gold Certification based on LEED BD+C New Construction Version 4. The project at a minimum is to adhere to ASHRAE 90.1-2010

The City of Richmond will provide an Owner's Project Requirements and Basis of Design document. City of Richmond Policy 2306 – Sustainable Facilities – High Performance Building Policy is to be followed.

### Corner Plaza

A corner plaza, to the south east of the facility, shall be provided with high quality, durable finishes with plaza surfaces that are easy to maintain and prevent a trip hazard from happening over time. The purpose of the corner plaza is to extend the interior lobby space to the exterior. Within the corner plaza and/or elsewhere along the frontage of the community centre, permanent tables and seating shall be provided (generally in 4 groups of 4 seats each for a total seating capacity of 16). Tables shall be designed to entice patrons to stay. An example would be chess boards permanently imprinted into the table tops. Electrical receptacles for power with USB ports shall be provided at each table.

Allowance to be made for bicycle racks and waste and recycling receptacles.

An overhead canopy which provides shelter to rain for at least two of the seating groups is strongly desired.

A free-standing concrete pylon housing a gas connection for portable BBQs is required. Final location within the plaza to be determined.

### Floor to Floor Heights and Special Construction

Clear ceiling heights, unobstructed by structure, lighting, ventilation, piping, signage, or other features, of at least 9.14 m (30.0 ft.) in the "village square" (i.e. gymnasium) and as noted in each of the room data sheets for other rooms are required. The Children's Exploration room requires a clear height of 4.26m (14.0 ft.) per the room data sheet and a 1.22m (4.0 ft.) depression for a portion of the room. The depression shall only sit over areas below, which can accommodate a lower ceiling height.

Floor depressions shall be provided elsewhere as required for specialty flooring such that all floor finishes are flush from room to room. (Flooring types that require slab depressions include sprung wood floors, pulastic floors and playtile floors.)

### Acoustic Requirements

It's extremely important to minimize sound transfer between the community centre and any nearby residential uses. Horizontal wall STC rating between any community centre space and any adjacent residential living spaces

needs to be a minimum of STC-62 and a minimum of STC-65 for bedrooms. Minimize horizontal sound transfer between the community centre floor slabs and residential construction with structural breaks in the floor slabs at the edge of the community centre.

Floor construction and finishes in the community centre should proactively manage any structural impact noise input from the Activity Room, Activity Track, or Sports Hall that might affect the residential structure.

### **Column Locations**

Column free spaces are required for all program rooms. In addition the Village Square Sports Hall, Activity Track and Children’s Exploration room must be column free and cannot have protrusions within the wall surfaces. For other program rooms, columns may be permitted around the perimeter of the room with consultation and prior agreement from the City.

### **Floor Openings**

Make provision for a large floor opening to connect the lower and upper lobby areas. Tempered and laminated glass guardrails to be provided around the opening. Other options could be considered at the discretion of the City.

### **Entry Vestibules**

Entry vestibules are to be provided at the main entrance from the street and also at the parkade entrance. These vestibules shall be designed to meet ASHRAE 90.1-2010 and shall be equipped with automatic doors suitable for barrier free access.

### **Elevator**

3500lb hydraulic passenger elevator shall be provided. Cab size to suit stretchers. Flooring to match lobby flooring. Stainless steel doors and plastic laminate interior cab finish. Specifications will need to be pre-approved by the City .

### **Exits**

Sufficient width of exits to be provided per the BC Building Code such that upper floor occupancy can be accommodated without limitations. Occupancy of each room space shall be based on the occupancy load factors detailed in the BC Building Code and/or Fire Code.

Main exit stair which serves the dual function of exit and convenience access from main and upper floors shall be glazed. Fire protection shall be via window washing sprinklers. Alternate solution for this sprinkler type to be provided to the City of Richmond Building Department.

### **Heating and Cooling**

Heating and cooling systems shall be designed to meet temperature requirements listed in the room data sheets and also contribute to the energy credits for LEED and meet the requirements of the current edition of the BC Building Code. Equipment type/manufacturer will have to be approved by City of Richmond.

Ensure low noise levels of all units. HVAC ducting for supply and return air must be configured to eliminate sound transfer through the ducts between individual rooms, or control breakout from the ducts to the receiving spaces.

Maximum noise levels in NC shall be as follows:

- Village Square Sports Hall: 40
- Multipurpose, Art, Creativity Lab and Activity Rooms: 25
- Staff Areas: 25
- Children’s Exploration Room: 35
- Lobby and circulation spaces: 40

The Village Square Sports Hall, Activity Track, Activity Room shall have the ability to heat up and cool down rapidly.

Control of the community centre’s systems shall be from City of Richmond’s DDC system.

### **Ventilation**

Typically air changes shall be designed to meet the requirements of the current edition of the BC Building Code and ASHRAE 62.1-2010.

In washrooms, double the BCBC requirement shall be provided, however demand-control ventilation in washrooms is permitted.

Extra exhaust requirements have been noted in the room data sheets.

Provide exhaust air heat recovery.



## **Fire Alarm**

Fire alarm wiring and zone designation shall be provided for the community centre.

## **Exterior Lighting**

Adequate lighting levels shall be provided in the plaza area to prevent undesirable activity and give a sense of security to visitors. Exterior lighting shall be controlled based on a time schedule that will be confirmed by the City.

LED lighting is preferred.

## **Security**

Security camera system to be provided for entire facility (internal and external), according to current industry best practices for community centres. Display cameras to be linked back to a central location that will be integrated with the City's monitoring/security system.

Door alarms at all exterior operable doors and motion detector for spaces adjacent to the exterior walls on the ground level is required. City of Richmond Honeywell system to be considered for base building as well as TI.

## **Doors and Hardware**

Alarmed doors will be required at exit corridors. Exterior doors and parkade doors shall be equipped with proximity card reader.

Main entry door and parkade door shall be equipped with a handicapped door operator.

All door hardware shall be institutional quality. Access control should be compatible with the City's specified system.

## **Maintenance**

Building equipment monitoring and integration guidelines (attached).

Building lighting guidelines (attached).

DDC requirements (attached).

## **Interior Finishes Level**

The finishes for the City Centre Community Centre North interior will be equivalent to or better than the finishes found in the recently built City Centre Community Centre located at 105-5900 Minoru Boulevard.

## **Room Data Sheets**

Detailed space requirements for each of the rooms listed in the program were established and are included in room data sheets that follow.





**ACTIVITY TRACK****PROGRAM**

## PROGRAM INFORMATION

Indoor two lane running/walking track around the perimeter of the Village Square  
 4' wide lanes  
 Use for walking during months of rainy weather, for short track training and for active programs such as bootcamp, interval training, etc.  
 Elevated

## KEY ADJACENCIES

Within Village Square; alternate locations may be considered

TECHNICAL NEEDS/  
CONSIDERATIONS

Location of track to not interfere with required clearances for sports within Village Square; no free-standing columns permitted for supporting the track from below

## OTHER

-

**FUNCTION**

## AREA

2800 s.f.

## STORAGE

N/A

## CEILING HEIGHT

Min. 8'-0" clear from track floor to underside of structure above; or observe clear height requirements for sports if track overlaps courts

## OCCUPANT LOAD

60

SPECIAL  
CONSIDERATIONS

Provide adequate space around running track to accommodate stretching/resting

**FINISHES**

## FLOOR

Fluid applied athletic floor: Robbins Pulastic Classic 110 (no substitutions)

## BASE

Rubber base

## WALLS

Tempered glass interior walls from finished floor to 8'-0" a.f.f.; tempered laminated glass guardrails around track

## CEILING

See Village Square requirements

## DOORS

Tempered glass aluminum doors; card reader at entrance to room

## MISC. SPECIALTIES

Corner guards

## ACOUSTICS

Acoustical requirements as per Village Square

SPECIAL  
REQUIREMENTS

-

**MECHANICAL/ELECTRICAL**

## MECHANICAL

## HVAC

As per Village Square requirements

## PLUMBING

Chilled Water fountain w/ bottle filler outside of room in Upper Lobby adjacent to washrooms

## OTHER

-

## ELECTRICAL

## POWER

Outlets for housekeeping

## LIGHTING

As per Village Square requirements

## COMMUNICATION

As per Village Square requirements, Wifi\*

## SECURITY

Card reader

## AUDIO/VISUAL

As per Village Square requirements

## ROOM DATA

## MULTIPURPOSE ROOM 1 &amp; 2

## PROGRAM

PROGRAM INFORMATION	Flexible space to support a variety of programs including active programs, yoga, games, discussion groups, children's programs and banquets One Multipurpose room to house a universal washroom to support Seniors programming.
KEY ADJACENCIES	Both rooms adjacent to each other is preferred One room to be adjacent to Village Square to allow for use as a green room to support performances within the Village Square Adjacent to kitchen
TECHNICAL NEEDS/ CONSIDERATIONS	FM Listening assistance system for hearing impaired in MP room with unit washroom; daylighting; clear span, column-free space for usability and flexibility of space
OTHER	Wall adjacent to Village Square to allow for door openings and glazing into the Village Square; MP1 to be divisible into two equal spaces via folding wall; MP1 to open to lobby via glazed sliding wall front: Kawneer 1040 or equal

## FUNCTION

AREA	1500 s.f.
STORAGE	150 s.f.
CEILING HEIGHT	10'-0" clear minimum
OCCUPANT LOAD	30 for Yoga; 120 for Banquets; 140 for lectures (final occupant load will depend on room configuration)
SPECIAL CONSIDERATIONS	Storage for tables and chairs

## FINISHES

FLOOR	Sheet Vinyl (wood grain pattern) with resilient backing / or just sheet vinyl pattern to be confirmed.
BASE	Stained wood base
WALLS	Gypsum Board; tempered glass interior walls for daylighting from finished floor to 8'-0" a.f.f.
CEILING	Acoustic Ceiling Tile
DOORS	Wood, Stained; card reader at entrance to room
MISC. SPECIALTIES	Window Blinds (blackout blinds for MP Room 1), wall protection, corner guards; folding wall in Multipurpose 1: manual top supported with STC rating of 56: Modernfold or equal, white board
ACOUSTICS	Reverberation time: 0.5 seconds unoccupied (500-2000Hz) Ambient or background noise level (all sources): NC-35 Door STC rating Multipurpose Room 1: To Sports Hall, STC-40; to Hallway, STC-35 Minimum wall STC Rating Multipurpose Room 1: To Sports Hall, STC-53; to hallway, STC-52  Minimum wall STC Rating Multipurpose Room 2: To Hallway, STC-50; to Children's Exploration Room, STC-53 Minimum IIC rating of Multipurpose Room 2 to lower floor offices and MP Room 1: IIC-60
SPECIAL REQUIREMENTS	All walls between community centre activity rooms must be full height to the structure, and any penetrations of the walls, or gaps at the ceilings should be caulked, filled or fire stopped to maintain STC ratings. Hallways/Corridors Reverberation time: 0.5 seconds unoccupied (500-2000Hz) typical.

ROOM DATA

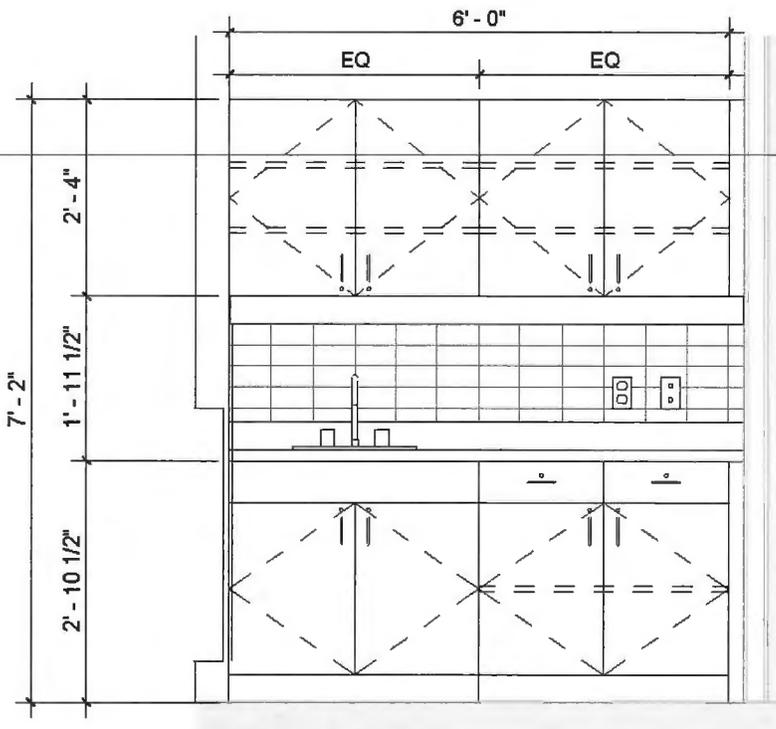
### MULTIPURPOSE ROOM 1 & 2

#### MECHANICAL/ELECTRICAL

MECHANICAL	HVAC	20C to 24C temperature range
	PLUMBING	Sink in both MP rooms, universal washroom in one MP room (see typical washroom for details)
	OTHER	-
ELECTRICAL	POWER	Ceiling mounted projection screen, ceiling mounted projector, in-floor and wall outlets
	LIGHTING	Two levels of lighting
	COMMUNICATION	Wifi*, in-floor and wall data outlets; rough-in outside entry door for room schedule information panel; outlets above counter; telephone
	SECURITY	Card reader
	AUDIO/VISUAL	FM listening assistance system for hearing impaired in MP room with unit washroom, sound system, ceiling mounted LED/Laser projector and motorized projection screen; PA System, AV control wall panel; Wall AV inputs

#### MILLWORK

Upper and lower plastic laminate on plywood cabinets and drawers complete with under cabinet light valance and ceramic tile backsplash  
Provide 3 units in total, one in each half of MP1 and one in MP2; alternatively provide one double unit in MP1



## ROOM DATA

**MULTIPURPOSE ROOM 3****PROGRAM**PROGRAM  
INFORMATION

Flexible space to support a variety of programs including meetings  
 This room is the lowest in priority and may not be able to be accommodated in the layout

## KEY ADJACENCIES

Can be located on upper level  
 Close proximity to upper level washrooms

TECHNICAL NEEDS/  
CONSIDERATIONS

Daylighting

## OTHER

Column-free space for usability and flexibility of space

**FUNCTION**

## AREA

600 s.f.

## STORAGE

Within millwork in room

## CEILING HEIGHT

9'-0" clear minimum

## OCCUPANT LOAD

30; group classes for up to 12

SPECIAL  
CONSIDERATIONS

-

**FINISHES**

## FLOOR

Linoleum

## BASE

Rubber Base

## WALLS

Gypsum Board, tempered glass interior walls for daylighting from finished floor to 8'-0" a.f.f.

## CEILING

Acoustic Ceiling Tile

## DOORS

Wood, Stained; card reader at entrance to room

## MISC. SPECIALTIES

Window Blinds, wall protection, corner guards; chair rail; whiteboard

## ACOUSTICS

Sound separation from adjacent rooms; requirements similar to MP 1 and MP 2

SPECIAL  
REQUIREMENTS

Millwork and sink counter: Refer to Multipurpose 1 & 2 for millwork requirements

**MECHANICAL/ELECTRICAL**

## MECHANICAL

HVAC	20C to 24C temperature range
PLUMBING	Sink
OTHER	-

TV, in-floor outlets, additional wall outlets

Two levels of lighting

Wifi\*, in-floor and wall data outlets; rough-in outside entry door for room schedule information panel; outlets above counter; telephone

Card reader

Sound system, fully integrated display system with wall mounted TV; PA System, AV control wall panel; Wall AV inputs

ROOM DATA

# ACTIVITY ROOM

## PROGRAM

<b>PROGRAM INFORMATION</b>	Medium impact recreational programs such as dance, yoga, fitness, pilates, some martial arts
<b>KEY ADJACENCIES</b>	Can be located on the upper level
<b>TECHNICAL NEEDS/ CONSIDERATIONS</b>	Sprung wood floors; Visual privacy required and may be achieved with roller blinds; Adjustable height ballet barres and mirrors; extra high ceiling for creative dance
<b>OTHER</b>	Column-free space for usability and flexibility of space

## FUNCTION

<b>AREA</b>	2000 s.f.
<b>STORAGE</b>	200 s.f.
<b>CEILING HEIGHT</b>	12'-0" clear
<b>OCCUPANT LOAD</b>	195; 20 for dance; 45 for fitness classes; 16 for martial arts
<b>SPECIAL CONSIDERATIONS</b>	Storage with either roll up doors or mirrored doors; Storage of mats, fit balls, body bars, steps, bosu balls and resistance equipment, etc.

## FINISHES

<b>FLOOR</b>	Sprung Wood Floor: Robbins Bio-Cushion system with bio-pads and second grade and better maple
<b>BASE</b>	Vented Base
<b>WALLS</b>	Gypsum Board, tempered glass interior walls to allow for daylighting of adjacent spaces from finished floor to 8'-0" a.f.f.
<b>CEILING</b>	Acoustic Ceiling Tile
<b>DOORS</b>	Glazed Aluminum doors, Aluminum Overhead Doors at Storage Room; card reader at entrance to room
<b>MISC. SPECIALTIES</b>	Entire wall (approximately 50' length) of mirrors from 6" a.f.f. to 8'-0" a.f.f., Adjustable height ballet barres, Roller blinds
<b>ACOUSTICS</b>	Treatment for reverberation, sound separation from adjacent rooms Reverberation time: 0.5 seconds unoccupied (500-2000Hz) Ambient or background noise level (all sources): NC-35 Door STC rating: To Hallway, STC-40 Minimum wall STC Rating: To Hallway, STC-53; to Activity Track/Sports Hall, STC-53 Floor STC Rating to Truck/Garbage area, STC-60
<b>SPECIAL REQUIREMENTS</b>	-

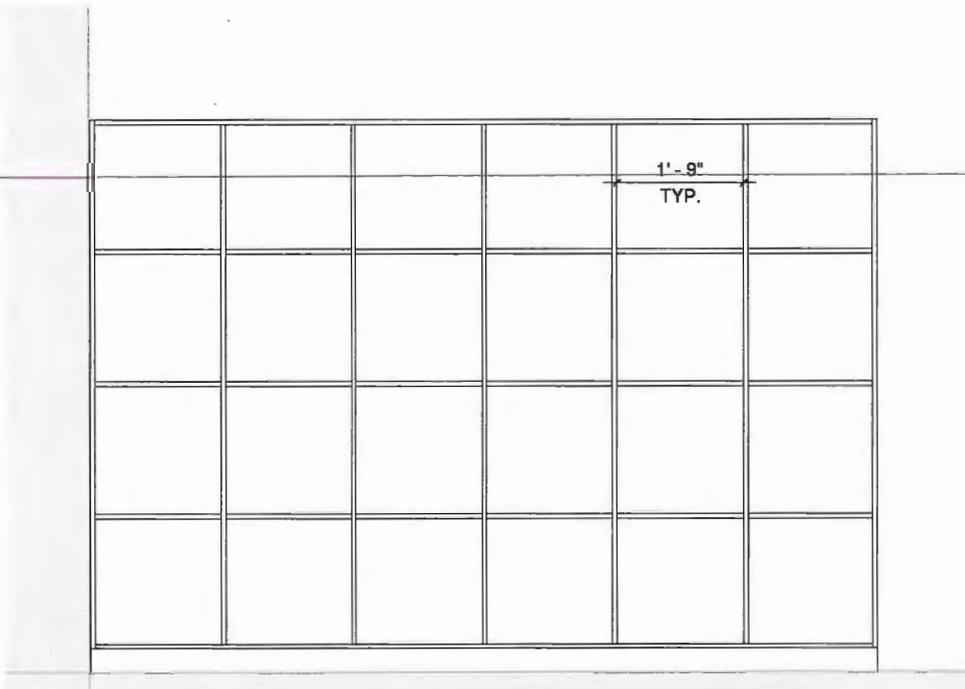
# ACTIVITY ROOM

## MECHANICAL/ELECTRICAL

MECHANICAL	HVAC	Temperature range 25-16 degrees, in-room temperature control
	PLUMBING	-
	OTHER	-
ELECTRICAL	POWER	Housekeeping outlets, sound system. Wall data jacks at several locations in room.
	LIGHTING	Variable lighting levels ideally in different zones to create ambiance
	COMMUNICATION	Wifi*; telephone
	SECURITY	Card reader
	AUDIO/VISUAL	Sound System with stronger output speakers for fitness classes, include speed variable CD player with blue-tooth; Ipod and AV inputs, ability to connect to wireless/remote microphone for teaching classes, AV control wall panel; PA system

## MILLWORK

Plastic laminate on plywood bag cubbies - 24 cubbies





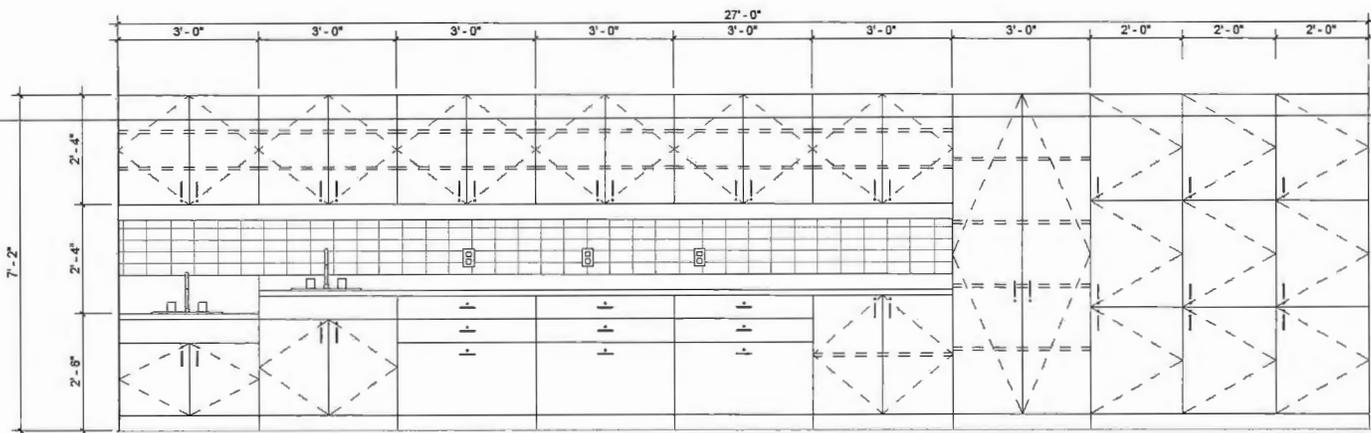
# WET ART STUDIO

## MECHANICAL/ELECTRICAL

MECHANICAL	HVAC	Enhanced Ventilation for art activities ie. pottery glazing, oil painting
	PLUMBING	2 Sinks (1BF height), Interceptors for sinks
	OTHER	-
ELECTRICAL	POWER	In-floor outlets and 20 additional wall outlets at various heights
	LIGHTING	Multiple lighting controls
	COMMUNICATION	Wifi*, in-floor and wall data outlets, outlets above counter, telephone
	SECURITY	Card reader
	AUDIO/VISUAL	Sound system, AV control wall panel, Wall AV inputs; PA system; Wall mounted TV

## MILLWORK

Full height, upper and lower plastic laminate on plywood cabinets and drawers complete with under cabinet light valance, ceramic tile backsplash and stainless steel countertops; one sink at barrier free height



ROOM DATA

# CREATIVITY LAB

## PROGRAM

PROGRAM INFORMATION	Technology room that facilitates "Maker" activities such as art, electronics, robotics, music, crafts, kinetic sculptures, fine art, computers, quilting, farming, engineering and more. Use of room for groups working on media projects, inventions, etc.
KEY ADJACENCIES	Can be located on upper level
TECHNICAL NEEDS/ CONSIDERATIONS	Hard wearing non staining floor (durable, good quality, low maintenance); Additional wall outlets and in-floor outlets, sink, enhanced ventilation; counter for electronics and soldering
OTHER	Storage room must be sized to fit tables and 20 chairs, especially if movable tables aren't purchased; Column-free space for usability and flexibility of space

## FUNCTION

AREA	1200 s.f.
STORAGE	200 s.f.
CEILING HEIGHT	9'-0" clear
OCCUPANT LOAD	60
SPECIAL CONSIDERATIONS	-

## FINISHES

FLOOR	Linoleum
BASE	Rubber Base
WALLS	Gypsum Board, tempered glass interior walls for daylighting from finished floor to 8'-0" a.f.f.
CEILING	Acoustic Ceiling Tile
DOORS	Wood, Stained; aluminum overhead doors at storage room; card reader at entrance to room
MISC. SPECIALTIES	Paper towel dispenser, wall protection, corner guards
ACOUSTICS	Sound separation from adjacent rooms Reverberation time: 0.5 seconds unoccupied (500-2000Hz) Ambient or background noise level (all sources): NC-35 Door STC rating: To Hallway, STC-30 Minimum wall STC Rating: To Hallway, STC-50; to Wet Art Studio, STC-53 Floor STC Rating to Truck/Parkade area, STC-60
SPECIAL REQUIREMENTS	Washable surfaces and easy to clean flooring; stainless steel countertop and backsplash





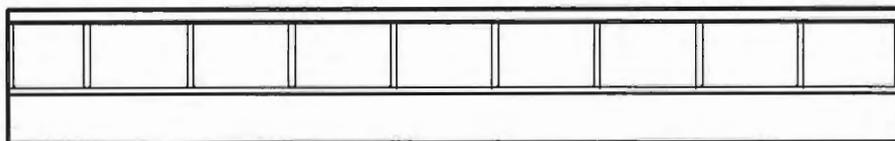
# CHILDREN'S EXPLORATION ROOM

## MECHANICAL/ELECTRICAL

MECHANICAL	HVAC	Temperature range 25-16 degrees, in-room temperature control
	PLUMBING	-
	OTHER	-
ELECTRICAL	POWER	Housekeeping outlets
	LIGHTING	Daylighting is preferred, with backup room lighting; recessed lights, hanging lights not permitted
	COMMUNICATION	Wifi*; counter or wall telephone outlets
	SECURITY	Emergency intercom to front desk; security camera; card reader
	AUDIO/VISUAL	Sound System; PA System

## MILLWORK

Millwork benches complete with plastic laminate on plywood complete with shoe cubbies below  
 Bench length to accommodate 4,0 cubbies



ROOM DATA  
**KITCHEN**

**PROGRAM**

PROGRAM INFORMATION

Support space for multiple rooms. Facilitates in-person social networking  
Square or close to square in proportions to allow for groups to gather within the room  
Possible use for culinary arts/teaching programs, class size up to 12 persons  
Food prep/support space

KEY ADJACENCIES

Adjacent to Village Square and adjacent or close to Multipurpose rooms; Direct access to corridor allows for easy access to room for deliveries and use of room without disrupting adjacent programs; adjacent to Janitor Closet

TECHNICAL NEEDS/  
CONSIDERATIONS

Pass through window to adjacent Village Square and possibly Multipurpose rooms

OTHER

Kitchen equipment requirements and NFPA code requirements; Accessible grease interceptor; Lockable millwork; Double BCBC/ Canadian Electrical Code for required electrical outlets on separate circuits

**FUNCTION**

AREA

500 s.f.

STORAGE

N/A

CEILING HEIGHT

8'-6"

OCCUPANT LOAD

12

SPECIAL  
CONSIDERATIONS

Commercial Kitchen, upper and lower millwork cabinets, stainless steel countertops preferred

**FINISHES**

FLOOR

Sheet Vinyl with cove base, non slip

BASE

Sheet vinyl cove base

WALLS

Gypsum Board, tile or stainless steel behind sinks and dishwasher (areas of high moisture)

CEILING

Moisture Resistant Gypsum Board

DOORS

Wood, stained, dutch door; card reader at entrance to room

MISC. SPECIALTIES

Paper towel dispenser, soap dispenser, aluminum coiling counter shutter on wall between Kitchen and Multipurpose room or Sports Hall depending on final room location

ACOUSTICS

Refer to adjacent rooms

SPECIAL  
REQUIREMENTS

Durable, washable finishes; light colours





## RECEPTION INCLUDING RFC AND CASH

## MECHANICAL/ELECTRICAL

MECHANICAL	HVAC	Staff access to heating controls; Exhaust for photocopier; Ensure adequate heat for staff at reception desk during winter months with time-out controls
	PLUMBING	-
	OTHER	-
ELECTRICAL	POWER	Dedicated outlets for computer equipment, dedicated outlet for photocopier, AV equipment, Information display boards; outlets at front millwork desk for all required systems including receipt printers, debit machines
	LIGHTING	General lighting and pendant lights over reception desk
	COMMUNICATION	Wifi*, data wall outlets and data outlets under millwork, 4 POS stations; Ability to lock/unlock rooms-visual monitor; Telephones
	SECURITY	Public display of CCTV monitor
	AUDIO/VISUAL	Controls for facility Sound System, facility displays and PA System; Fully integrated display system with wall mounted displays for public information

## MILLWORK

Reception desk for four staff with the following characteristics:

- 4 computers/monitors
- Standing height counter for staff
- Keyboard trays for each station
- Cash drawers for two stations
- Solid Surface Transaction top
- Barrier free desk
- Two below counter printer drawers

---

- Additional countertop space for security monitor
- Wire management below counter
- Minimum 2 Drawer units for storage, shared between two staff

Work Area to support reception:

Combination of upper and lower cabinets and drawers with plastic laminate countertops and space for two workstations for staff

ROOM DATA

# STAFF ROOM WITH FIRST AID

## PROGRAM

PROGRAM INFORMATION	Space for staff lunches and breaks for up to 8 staff at one time; Location for first aid supplies This space may provide passive supervision of other spaces if desired via windows This space is not intended as a treatment space for the public in case of injury
KEY ADJACENCIES	Located within administration area, away from reception
TECHNICAL NEEDS/CONSIDERATIONS	No dedicated storage room; some storage available in millwork cabinets; Typical staff room requirements including metal lockers
OTHER	-

## FUNCTION

AREA	200 s.f.
STORAGE	N/A
CEILING HEIGHT	8'-0"
OCCUPANT LOAD	6-8
SPECIAL CONSIDERATIONS	Staff lunch room; houses first aid equipment; glazing into room

## FINISHES

FLOOR	Linoleum
BASE	Rubber Base
WALLS	Gypsum Board, tempered glass interior walls for daylighting from finished floor to 8'-0" a.f.f.
CEILING	Acoustic Ceiling tile
DOORS	Wood, Stained
MISC. SPECIALTIES	6 metal lockers with hasp, paper towel dispenser, soap dispenser
ACOUSTICS	Reverberation time: 0.5 seconds unoccupied (500-2000Hz) Ambient or background noise level (all sources): NC-35 Door STC rating: To Hallway, STC-30 Minimum wall STC Rating: To Hallway, STC-50
SPECIAL REQUIREMENTS	Millwork upper and lower cabinets, plastic laminate countertop

ROOM DATA

# STAFF ROOM WITH FIRST AID

## MECHANICAL/ELECTRICAL

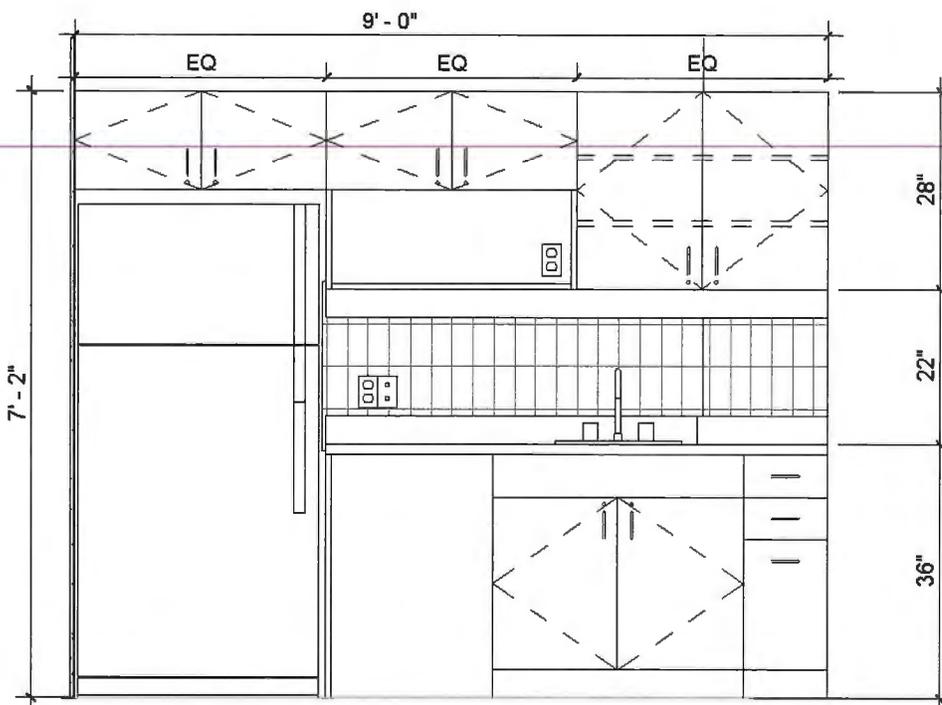
MECHANICAL	HVAC	20C to 24C temperature range
	PLUMBING	Sink with garburator, Small apartment sized dishwasher
	OTHER	Room temperature control
ELECTRICAL	POWER	Appliances including refrigerator, apartment sized dishwasher, microwave, over counter outlets; small Kitchenette setup
	LIGHTING	Occupancy sensor
	COMMUNICATION	Wifi*, Data wall outlet above counter, USB outlets
	SECURITY	-
	AUDIO/VISUAL	PA System

## MILLWORK

Upper and lower plastic laminate on plywood cabinets and drawers complete with under cabinet light valance and ceramic tile backsplash

Microwave shelf

Space for full height fridge and under counter dishwasher



ROOM DATA

# MEETING ROOM

## PROGRAM

PROGRAM INFORMATION

Multi-use meeting room for staff meetings, informal discussions, training, one on one meetings; space for up to 8 people

KEY ADJACENCIES

Preferred location within administration area; alternate locations may be considered

TECHNICAL NEEDS/  
CONSIDERATIONS

Glazed door and optional glazed screen recommended  
No storage within this room, items must be stored in alternate location

OTHER

-

## FUNCTION

AREA

200 s.f.

STORAGE

N/A

CEILING HEIGHT

8'-6" Clear

OCCUPANT LOAD

8

SPECIAL CONSIDERATIONS

Meeting space for up to 8 people

## FINISHES

FLOOR

Linoleum

BASE

Rubber Base

WALLS

Gypsum Board, tempered glass interior walls for daylighting from finished floor to 8'-0" a.f.f.

CEILING

Acoustic Ceiling Tile

DOORS

Wood, Stained; card reader at entrance to room

MISC. SPECIALTIES

Blinds; Chair rail; White board

ACOUSTICS

Sound separation from adjacent rooms  
Reverberation time: 0.5 seconds unoccupied (500-2000Hz)  
Ambient or background noise level (all sources): NC-35  
Door STC rating: To Hallway, STC-30  
Minimum wall STC Rating: To Hallway, STC-50

SPECIAL REQUIREMENTS

-

ROOM DATA  
**MEETING ROOM**

**MECHANICAL/ELECTRICAL**

MECHANICAL	HVAC	20C to 24C temperature range
	PLUMBING	Plumb for future sink at millwork counter
	OTHER	Room temperature control
ELECTRICAL	POWER	AV equipment; wall outlets
	LIGHTING	-
	COMMUNICATION	Wifi*, data wall outlets; Rough-in outside entry door for room schedule information panel; Telephone
	SECURITY	Card reader
	AUDIO/VISUAL	PA System, Fully integrated display system with wall mounted TV; AV control wall panel; Wall AV inputs; Smart-board

**MILLWORK**

Plumb for future water / sink. At this point we don't think millwork will be required due to size of room, would like option in future.

# SHARED OFFICE

## PROGRAM

PROGRAM INFORMATION	Shared office space with 8 workstations Programming staff; Building Service Workers (BSW)
KEY ADJACENCIES	Within administration area, connectivity to reception desk
TECHNICAL NEEDS/ CONSIDERATIONS	Glazed door and optional glazed screen recommended Storage within cabinets, large items must be stored in alternate location
OTHER	-

## FUNCTION

AREA	450 s.f.
STORAGE	N/A
CEILING HEIGHT	8'-6" Clear
OCCUPANT LOAD	8
SPECIAL CONSIDERATIONS	Ensure access to all power and data with systems furniture design

## FINISHES

FLOOR	Linoleum/carpet
BASE	Rubber Base
WALLS	Gypsum Board, tempered glass interior walls for daylighting from finished floor to 8'-0" a.f.f.
CEILING	Acoustic Ceiling Tile
DOORS	Wood, Stained; card reader at entrance to room
MISC. SPECIALTIES	Systems furniture
ACOUSTICS	Sound separation from adjacent rooms; systems furniture design to promote sound isolation within each cubicle; possible requirement for noise cancelation system  Reverberation time: 0.5 seconds unoccupied (500-2000Hz) Ambient or background noise level (all sources): NC-35 Door STC rating: To Hallway, STC-30 Minimum wall STC Rating: To Hallway, STC-50
SPECIAL REQUIREMENTS	-

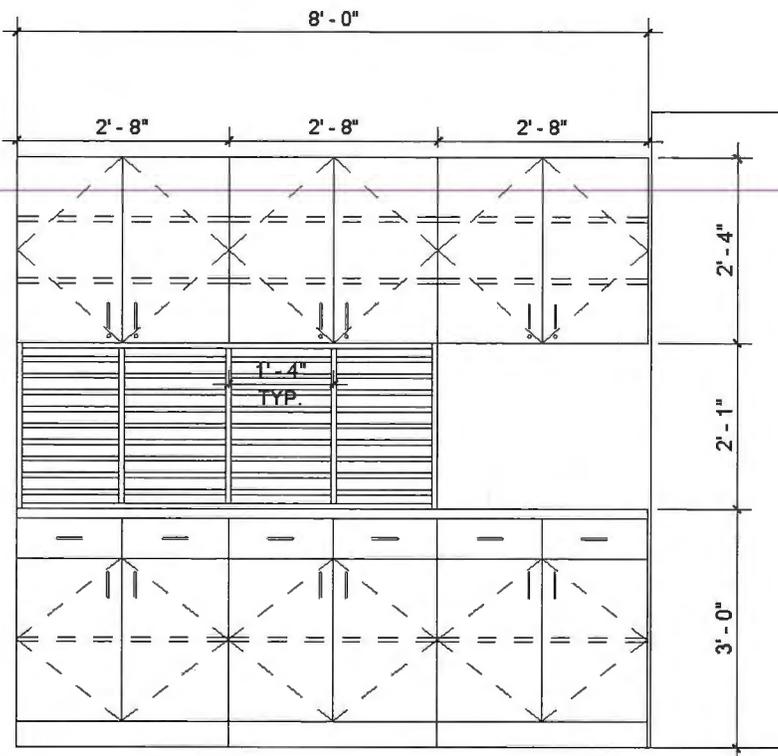
ROOM DATA  
**SHARED OFFICE**

**MECHANICAL/ELECTRICAL**

MECHANICAL	HVAC	20C to 24C temperature range
	PLUMBING	-
	OTHER	Room temperature control
ELECTRICAL	POWER	Outlets for computers plus additional outlets, telephone, dedicated printer
	LIGHTING	General room lighting and task lighting
	COMMUNICATION	Wifi*, data wall outlets: minimum 3 Cat6 per desk plus additional outlets, telephone
	SECURITY	Card reader on entry door
	AUDIO/VISUAL	PA System

**MILLWORK**

Upper and lower plastic laminate on plywood cabinets with mail slots and drawers



**AREA COORDINATOR OFFICE****PROGRAM**

## PROGRAM INFORMATION

Single office for one occupant  
Space for visitors

## KEY ADJACENCIES

Within administration area, connectivity to shared office

TECHNICAL NEEDS/  
CONSIDERATIONSGlazed door and optional glazed screen recommended  
Storage within cabinets, large items must be stored in alternate location

## OTHER

-

**FUNCTION**

## AREA

100 s.f.

## STORAGE

N/A

## CEILING HEIGHT

8'-6" Clear

## OCCUPANT LOAD

1 typical, up to 3

SPECIAL  
CONSIDERATIONS

-

**FINISHES**

## FLOOR

Linoleum/carpet

## BASE

Rubber Base

## WALLS

Gypsum Board, tempered glass interior walls for daylighting from finished floor to 8'-0" a.f.f.

## CEILING

Acoustic Ceiling Tile

## DOORS

Wood, Stained

## MISC. SPECIALTIES

Systems furniture

## ACOUSTICS

Sound separation from adjacent rooms

Reverberation time: 0.5 seconds unoccupied (500-2000Hz)

Ambient or background noise level (all sources): NC-35

Door STC rating: To Hallway, STC-30

Minimum wall STC Rating: To Hallway, STC-50

SPECIAL  
REQUIREMENTS

-

# AREA COORDINATOR OFFICE

## MECHANICAL/ELECTRICAL

MECHANICAL	HVAC	-
	PLUMBING	-
	OTHER	Room temperature control
ELECTRICAL	POWER	Outlets for computers plus additional outlets, telephone, dedicated printer
	LIGHTING	General room lighting and task lighting
	COMMUNICATION	Wifi*, data wall outlets, telephone
	SECURITY	-
	AUDIO/VISUAL	PA System

## MILLWORK

None required

ROOM DATA  
**LOBBY**

**PROGRAM**

PROGRAM INFORMATION	Unique gathering space or spaces within a larger room to encourage "pods of interaction"; Creates context for the community, houses the community living room; Exhibition space, 3D public art Casual meeting/social space for non-programmed interaction; Addresses an expressed desire to use facility to assist in nurturing and developing sense of community; Room that provides 'identity' to the community centre Feature Internal stair to encourage public use
KEY ADJACENCIES	Adjacent to reception area to facilitate use as a program and/or un-programmed space; Connectivity to Children's Exploration Room; Connectivity to adjacent surroundings and possible connection to River via views, programs, streetscape Connected to exterior plaza that can support indoor/outdoor activities such as open houses in good weather
TECHNICAL NEEDS/ CONSIDERATIONS	Surfacing to suit primarily street shoe programming functions, good slip resistance required; fireplace is recommended as a focal point; Typically limited wall space; No storage requirements
OTHER	-

**FUNCTION**

AREA	2400 s.f.
STORAGE	N/A
CEILING HEIGHT	10'-0"
OCCUPANT LOAD	60
SPECIAL CONSIDERATIONS	Casual meeting/social space for approximately 60; non-program area and spill out space to exterior plaza; special events; Space to be divided into "nodes" via furniture, artwork, etc

**FINISHES**

FLOOR	Terrazzo, polished concrete or porcelain floor tile; Permanent walk-off mat at vestibules
BASE	Aluminum or porcelain floor tile
WALLS	Gypsum Board with specialty paneling
CEILING	Combination Acoustic Ceiling Tile with Gypsum Board Bulkheads and featured wood ceilings
DOORS	Automatic Glazed Aluminum doors at main entrance and parking entrance within vestibules; Sliding Glass wall opening to plaza: Nan-owall preferred
MISC. SPECIALTIES	Specialty paneling ie. Resin panels, Wood Paneling, etc.
ACOUSTICS	Noise Reduction Acoustic Panels; See also requirements noted on Reception Room Data Sheet
SPECIAL REQUIREMENTS	-

**MECHANICAL/ELECTRICAL**

MECHANICAL	HVAC	HVAC tied to exterior sliding doors
	PLUMBING	Chilled drinking fountain with bottle filler
	OTHER	-
ELECTRICAL	POWER	Charging stations for electronic devices; Fireplace; Television; Additional power to support events. Wall data jacks at regular intervals.
	LIGHTING	Potlights; specialty lighting to give living room feel
	COMMUNICATION	Wifi*, USB outlets
	SECURITY	Door alarms, motion detectors, etc.
	AUDIO/VISUAL	Television, PA system, Sound System, Electronic displays



# MAIN JANITOR ROOM + SECONDARY JANITOR CLOSET

## PROGRAM

### PROGRAM INFORMATION

Support program spaces; stores cleaning supplies and maintenance equipment  
Janitor Closet is also required on the upper level and houses second mop sink for the community centre; approximately 40 s.f.

### KEY ADJACENCIES

Accessed from primary circulation and /or lobby

### TECHNICAL NEEDS/ CONSIDERATIONS

Size to suit janitorial supplies, floor scrubber machine; floor mounted mop/slop sink; outlet for floor scrubber @ 3'-0" AFF; additional hand sink is preferred; Optional location for washer/dryer

### OTHER

-

## FUNCTION

### AREA

80 s.f. minimum

### STORAGE

N/A

### CEILING HEIGHT

8'-0"

### OCCUPANT LOAD

N/A

### SPECIAL CONSIDERATIONS

Storage of cleaning supplies and maintenance equipment

## FINISHES

### FLOOR

Sealed Concrete

### BASE

Rubber Base

### WALLS

Gypsum board or concrete block; ceramic tile to 5'-0" around mop sink

### CEILING

Exposed ceiling is acceptable

### DOORS

Painted Hollow Metal

### MISC. SPECIALTIES

Mop/broom holder, wall protection is required to 5'-0" a.f.f. if walls are gypsum board

### ACOUSTICS

-

### SPECIAL REQUIREMENTS

Slope floor to drain

## MECHANICAL/ELECTRICAL

### MECHANICAL

HVAC

-

PLUMBING

Mop sink, hand sink, floor drain; Optional location for washer/dryer

OTHER

-

### ELECTRICAL

POWER

Outlet for floor scrubber at 36" AFF; Preferred location for washer/dryer

LIGHTING

Occupancy sensor

COMMUNICATION

-

SECURITY

-

AUDIO/VISUAL

-

# COMMUNICATIONS

## PROGRAM

PROGRAM INFORMATION	Service room specific to the community centre
KEY ADJACENCIES	Central location within the community centre TBC with electrical consultant Communications room to have close proximity to administration area and ideally central within the community centre to service all areas under gom travel distance to avoid need of a second room. Access from corridor or staff space, not through a program space.
TECHNICAL NEEDS/ CONSIDERATIONS	Back of house space with no windows is ideal for these service rooms; non public space; locate away from in-wall, in-floor or in-ceiling plumbing
OTHER	-

## FUNCTION

AREA	100 s.f. : 10'-0" x 10'-0" dimensions, usable space after gyproc + plywood installed
STORAGE	N/A
CEILING HEIGHT	10'-0" minimum exposed ceiling to allow room for overhead trays, racks and hvac
OCCUPANT LOAD	N/A
SPECIAL CONSIDERATIONS	Service room supporting communication systems for the community centre

## FINISHES

FLOOR	Sealed Concrete
BASE	Rubber base
WALLS	Gypsum Board or Concrete Block
CEILING	Exposed painted to reduce dust
DOORS	Painted Hollow Metal
MISC. SPECIALTIES	Fire treated plywood on all walls, 10'-0" high for anchoring equipment and overhead trays
ACOUSTICS	-
SPECIAL REQUIREMENTS	-

## MECHANICAL/ELECTRICAL

MECHANICAL	HVAC	Dedicated unit that runs 24/7
	PLUMBING	-
	OTHER	-
ELECTRICAL	POWER	Emergency generator power; 120V/20A dedicated circuits for IT/racks, audiovisual, security on walls.
	LIGHTING	-
	COMMUNICATION	-
	SECURITY	Card reader on door; central equipment in this room; central AV equipment on communications rack Facility shall be ready to have security cameras installed throughout and be building alarm monitored
	AUDIO/VISUAL	-

# MECHANICAL

## PROGRAM

PROGRAM INFORMATION	Service room specific to the community centre
KEY ADJACENCIES	Central location within the community centre TBC with mechanical consultants
TECHNICAL NEEDS/ CONSIDERATIONS	Back of house space with no windows is ideal for service rooms; non public space
OTHER	-

## FUNCTION

AREA	TBD
STORAGE	N/A
CEILING HEIGHT	Exposed
OCCUPANT LOAD	N/A
SPECIAL CONSIDERATIONS	Service room supporting mechanical systems for the community centre

## FINISHES

FLOOR	Sealed Concrete
BASE	Rubber base
WALLS	Gypsum Board or Concrete Block
CEILING	Exposed
DOORS	Paint
MISC. SPECIALTIES	-
ACOUSTICS	Reverberation time: 0.8 seconds unoccupied (500-2000Hz); Door STC rating: To Hallway, STC-40; Minimum wall STC Rating: To Hallway and Kitchen, STC-53
SPECIAL REQUIREMENTS	-

## MECHANICAL/ELECTRICAL

MECHANICAL	HVAC	-
	PLUMBING	Floor drain in mechanical room
	OTHER	-
ELECTRICAL	POWER	TBC
	LIGHTING	-
	COMMUNICATION	Data wall outlets for DDC and monitoring
	SECURITY	Consider access control for room doors
	AUDIO/VISUAL	-

ROOM DATA

# ELECTRICAL

### PROGRAM

PROGRAM INFORMATION

Service room specific to the community centre

KEY ADJACENCIES

Central location within the community centre TBC with Electrical consultants

TECHNICAL NEEDS/  
CONSIDERATIONS

Back of house space with no windows is ideal for service rooms; non public space

OTHER

-

### FUNCTION

AREA

TBD

STORAGE

N/A

CEILING HEIGHT

Exposed

OCCUPANT LOAD

N/A

SPECIAL CONSIDERATIONS

Service room supporting electrical systems for the community centre

### FINISHES

FLOOR

Sealed Concrete

BASE

Rubber base

WALLS

Gypsum Board or Concrete Block

CEILING

Exposed

DOORS

Paint

MISC. SPECIALTIES

Fire treated plywood on all walls 8'-0" tall for anchoring equipment

ACOUSTICS

Reverberation time: 0.8 seconds unoccupied (500-2000Hz); Door STC rating: To Hallway, STC-40; Minimum wall STC Rating: To Hallway and Kitchen, STC-53

SPECIAL REQUIREMENTS

-

### MECHANICAL/ELECTRICAL

MECHANICAL

HVAC

-

PLUMBING

-

OTHER

-

ELECTRICAL

POWER

TBC

LIGHTING

-

COMMUNICATION

Data wall outlets for DDC and monitoring

SECURITY

Consider access control for room doors

AUDIO/VISUAL

-

# ROOM DATA PLAZA

## PROGRAM

PROGRAM INFORMATION	Active exterior gathering space, flexible for various uses, sized for physical activity and possibly sports as well as hosting of events such as markets, exhibitions, trade shows, etc; Inclusive space Connects interior to exterior via views and sliding glazed wall/doors Landscaped, seating areas
KEY ADJACENCIES	Ample connection to Village Square or Lobby via sliding glazed wall/doors to allow activities to spill outdoors; possible connection to Children's Exploration Room if this room is located on the main floor
TECHNICAL NEEDS/CONSIDERATIONS	Plaza space to consider all aspects that would encourage the public to inhabit and use the space including reduction of vehicular noise, safety, lighting, seating, landscaping, covered areas, plaza materials, etc.; Consider conflict with circulation of patrons requiring access to residential lobby
OTHER	Consider zoning the plaza to encourage large and small group gathering; possible use as an exterior Exploratorium Prominent exterior illuminated sign identifying the community centre; Pylon sign located away from the building

## FUNCTION

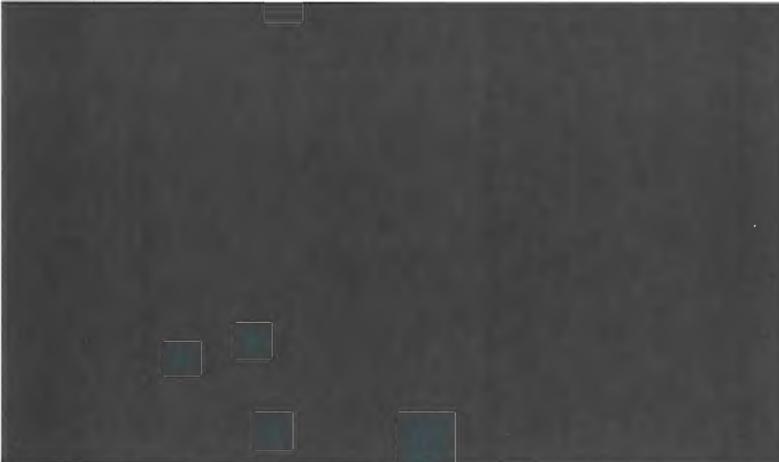
AREA	TBD
STORAGE	Some storage may be required to facilitate outdoor programs; consider sharing Village Square storage by providing door access to the plaza
CEILING HEIGHT	N/A
OCCUPANT LOAD	-
SPECIAL CONSIDERATIONS	Signage, bike racks

## FINISHES

FLOOR	Scored and/or coloured concrete; differentiate from adjacent public sidewalk; smooth surface for wheelchair users
BASE	-
WALLS	-
CEILING	-
DOORS	Sliding glass wall or doors
MISC. SPECIALTIES	Concrete or stone tables and chairs which cannot be moved from the plaza; metal furniture bolted to the plaza slab may be considered
ACOUSTICS	-
SPECIAL REQUIREMENTS	Extension of building canopy to provide a sheltered area in the plaza. Canopy large enough to provide rain-cover for some of the seating area

## MECHANICAL/ELECTRICAL

MECHANICAL	HVAC	-
	PLUMBING	Water connection via hose bibb with lockable access panel
	OTHER	Gas connection for BBQs at exterior wall or preferably concrete pylon freestanding in plaza
ELECTRICAL	POWER	Event power via minimum 4 exterior receptacles; power for two prominent exterior illuminated signs and for pylon sign; receptacle with USB port at each fixed table
	LIGHTING	Human scale, adequate to give a sense of safety
	COMMUNICATION	Wifi*; Data to pylon sign
	SECURITY	Door alarms on adjacent building doors
	AUDIO/VISUAL	Sound System, PA system



## Appendix A

City of Richmond Policy 2306  
– Sustainable Facilities “High  
Performance” Building Policy –  
City Owned Facilities

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**POLICY 2306:**

It is Council policy to:

**1. Undertake Comprehensive Financial Consideration**

Projects for new buildings and major renovations will be evaluated based on considerations of life-cycle costing and initial financial investment requirements.

**2. Incorporate High Performance Attributes into Building Design and Construction to the Maximum Extent Possible**

- LEED<sup>®</sup> BC will be used as the standard by which to assess building performance.
- That LEED Gold accreditation be set as the desired standard of building performance for new City buildings greater than 2000 sq.m (approximately 20,000 sq.ft).
- The City will seek to meet the performance standards of LEED Silver certification as a minimum requirement for major renovations to existing facilities and new City Buildings smaller than 2000 sq.m (20,000 sq.ft), but may not necessarily seek formal accreditation.

**3. Pursue Continual Improvement Through Building Retrofit and Efficient Building Maintenance**

Existing facilities and equipment will be upgraded to higher efficiencies as budgets and circumstances allow, and where the change offers a simple payback of no more than five years.

Equipment will be maintained to energy-efficient standards.

**4. Foster Awareness and Innovation**

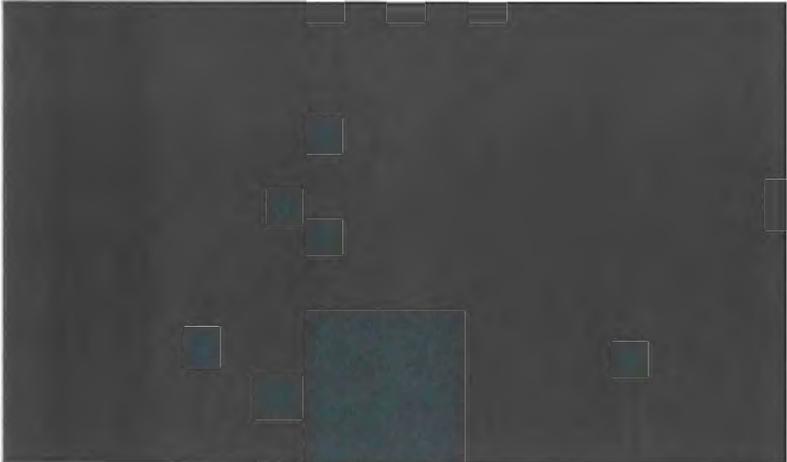
A continuous education program in resource efficiency procedures and practices will be maintained.

All employees will be encouraged to suggest and initiate projects that will save energy and optimize efficiencies in other resource areas (natural and financial).



**5. Undertake Regular Monitoring and Reporting**

Corporate energy consumption and extent to which the City has met its LEED building objectives will be monitored and reported on a regular basis using existing City reporting tools.



## **Appendix B**

City of Richmond Building  
Equipment, Monitoring, and  
Integration Requirements

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# City of Richmond

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ADMINISTRATIVE PROCEDURE

File Ref:

City of Richmond Building Equipment, Monitoring, and Integration Requirements

## City of Richmond Building Equipment, Monitoring, and Integration Requirements

### 1. DEFINITIONS:

#### ASHRAE:

- The American Society of Heating, Refrigerating and Air-Conditioning (ASHRAE) is an international standards organization for numerous building related systems. It is the organization's mission to advance the arts and sciences of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world. The Society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration and sustainability within the industry.

#### BACNet:

- Is an ANSI/ASHRAE standard communication protocol for direct digital control networks and automated building mechanisms. It was designed to be used for applications such as heating, ventilation, and air-conditioning control, lighting, access control, and fire detection systems and their associated equipment.

#### Canadian 2011 NECB:

- The National Energy Code of Canada for Buildings (NECB) 2011 provides minimum requirements for the design and construction of energy-efficient buildings and covers the building envelope, systems and equipment for heating, ventilating and air-conditioning, service water heating, lighting, and the provision of electrical power systems and motors.

#### Energy Star®:

- Is an international standard for energy efficient consumer products. The Energy Star® name and symbol are administered and promoted in Canada by Natural Resources Canada. Energy Star® qualified products meet strict technical specifications for energy performance—tested and certified. Devices carrying the Energy Star® identification, such as computer products and peripherals, kitchen appliances, buildings and other products, generally use 20–30% less energy than required by federal standards.

#### Energy Star® Certified

- Refers to Energy Star® certified products and buildings that meet strict North American energy performance standards. Typically these products and buildings use 20–30% less energy and cause fewer greenhouse gas emissions than comparable products and buildings.

#### Energy Star® Portfolio Manager™:

- Is an online tool you can use to measure and track energy use, water consumption, and greenhouse gas emissions, and benchmark your building's performance against similar type buildings in Canada. Portfolio Manager™ uses a 1-100 Energy Star® performance scale: a score of 50 indicates average energy performance (50<sup>th</sup> percentile) while a score of 75 or more indicates top performance (75<sup>th</sup> percentile). A score of 75 or more in a particular year allows for the facility to be Energy Star® Certified. The initial Canadian version of the



# City of Richmond

benchmarking tool in 2014 in Canada is solely applicable to K-12 school and commercial office facilities, other building types, such as community centres, will be added over time.

HVAC:

- Heating Ventilation and Air Condition (HVAC) is the technology of indoor environmental comfort. HVAC system design is a subdiscipline of mechanical engineering, based on the principles of thermodynamics, fluid mechanics, and heat transfer.

HVI:

- Home Ventilating Institute (HVI) is a nonprofit association offering a variety of services for manufacturers including, but not limited to, test procedures, certification and verification programs for airflow, sound and energy performance, and market support. Its mission is to serve consumers and members by advancing residential ventilation for healthy, energy-efficient homes.

IESNA:

- The Illuminating Engineering Society of North America (IESNA) is a non-profit organization that publishes standards for the lighting industry. The mission of the organization is to advance knowledge and disseminate information for the improvement of the lighted environment to the benefit of society. The IESNA lighting standards are developed through technical committees that include hundreds of qualified individuals from the lighting and user communities.

MERV:

- The minimum efficiency reporting value (MERV), is an ASHRAE measurement scale designed to rate the effectiveness of air filters. The scale is designed to represent the worst case performance of a filter when dealing with particles in the range of 0.3 to 10 micrometres. The MERV rating is from 1 to 16. Higher MERV ratings correspond to a greater percentage of particles captured on each pass, with a MERV 16 filter capturing more than 95% of particles over the full range.

MSTP:

- Multiple Spanning Tree Protocol (MSTP) is an open source communication protocol language connecting terminal controllers to main direct digital control processing system, and is defined by the applicable networking standard IEEE 802.1Q.

NRCan

- Natural Resources Canada (NRCan) works with other government departments, the provinces and territories, and other Canadian and international partners to address energy needs and potential while considering new policies, practises, and technologies.
- NRCan’s expertise in the areas of energy efficiency, and energy sources and distribution allows us to provide useful energy resources and help Canadians benefit economically, environmentally, and socially from the secure and sustainable production and use of Canada’s energy resources.

SEER:



# City of Richmond

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**ADMINISTRATIVE PROCEDURE**

File Ref:

City of Richmond Building Equipment, Monitoring, and Integration Requirements

- The Seasonal Energy Efficiency Ratio (SEER) rating of a unit is the cooling output during a typical cooling-season divided by the total electric energy input during the same period. The higher the unit's SEER rating the more energy efficient it is. In North America, the SEER is the ratio of cooling in British thermal unit (BTU) to the energy consumed in watt-hours.

#### TCP/IP:

- Transmission Control Protocol/Internet Protocol (TCP/IP) is the principal communications protocol in the Internet protocol suite for relaying datagrams across network boundaries.

#### Virtual Metering:

- Refers to the function of monitoring energy use of specific systems or pieces of equipment, based on demand and run time, through a building's direct digital control system and analog current transducers.



# City of Richmond

## 2. OPTIMIZE MAINTENANCE AND ENERGY PERFORMANCE:

This section is intended to provide a basis by which corporate facilities can be maintained and monitored to maximize efficient resource use, and reduced maintenance and operational costs.

- i. Operation Plan: Each facility should have an operational plan developed that at a minimum includes an occupancy schedule, equipment run-time schedule, design set points for HVAC equipment, and design lighting levels. This plan should be regularly reviewed and optimized as needed.
- ii. Measuring Energy Efficiency: Two options can be used to measure energy efficiency performance in comparison to typical buildings of similar type and function:
  - a. *Option 1:* Target an Energy Star® rating of 75% or higher, if eligible to receive an energy performance rating using the U.S. EPA's Energy Star® Portfolio Manager Tool (Canadian edition).
  - b. *Option 2:* If a building is not eligible to receive an energy performance rating using the U.S. EPA's Energy Star® Portfolio Manager Tool (Canadian edition), target increased energy efficiency of 20% as compared to typical buildings of similar type and function using national average energy data (National Resources Canada, Energy Star, et al).
- iii. Measurement and Verification. Track the energy and water use of specific systems, end uses (i.e. lighting, HVAC, plug loads, etc), and the building overall, to allow for continuous optimization. If possible, accomplish this requirement using the building automation system.
- iv. Benchmarking and Tracking Building Energy Consumption. Regularly compare energy performance data with previous years' energy performance data, to ensure operational energy efficiency is being maintained.
- v. Ongoing Commissioning. Complete re-commissioning activities on an approximately five year cycle to address changes in facility occupancy, use, maintenance and repair. Make periodic adjustments and review of building operating systems and procedures essential for optimal energy efficiency and service provision.
- vi. Building Automation System. Employ full building automation system for increased control and programming capability of mechanical system and lighting systems. It is required that City of Richmond pre-qualified building automation system supply and install contractors be used for new and replacement installations. Please see Section 5.0 for more details.
- vii. Local Thermostat: If applicable, use programmable thermostat that include energy efficient options including but not limited to; night set back, programmability for each day, optimal start, and zones separated by function.
- viii. Heat Recovery Ventilation Systems: Heat recovery ventilation systems used in corporate facilities need to be Home Ventilating Institute (HVI) certified with 85% efficiency



# City of Richmond

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## ADMINISTRATIVE PROCEDURE

File Ref:

City of Richmond Building Equipment, Monitoring, and Integration Requirements

- ix. Air or Ground Source Heat Pumps: Air or ground source heat pumps used in corporate facilities should be Energy Star® certified with a minimum target for energy efficiency of SEER 16.
- x. Gas Fired Rooftop unit: Gas fired rooftop units used in corporate facilities will target a minimum energy efficiency rating of SEER 13.
- xi. Heat Pump Rooftop units: Heat Pump rooftop units used in corporate facilities will target a minimum energy efficiency rating of SEER 16.
- xii. Roof top units: Economizer should be used for all rooftop units 5 tons or greater. All rooftop units, air handling units, Energy recovery ventilators (ERV), Heat recovery ventilators (HRV) and makeup air units, and shall use industry standard sized filters.
- xiii. Natural Gas Boiler: Natural gas boilers used in corporate facilities will target a minimum efficiency rating of 95%.
- xiv. Air Conditioning: Air conditioning equipment used in corporate facilities should be Energy Star® certified.
- xv. Air Compressor: All pneumatic air compressors should be equipped utilizing automatic condensate drain system. Air compressors for corporate truck maintenance activities, require a minimum of 200 PSI operating pressure.
- xvi. Domestic Hot Water: Domestic natural gas hot water boilers used in corporate facilities should be Energy Star® certified with a target minimum efficiency rating of 80%. Domestic electric hot water boilers used in corporate facilities should be Energy Star® certified with a target minimum efficiency rating of 90%.
- xvii. Appliances: Appliances (refrigerators, laundry machines, stoves, et al) used in corporate facilities should be Energy Star® certified.
- xviii. Ozone Depleting Compounds. Refrain from using Ozone Depleting Substances. Ozone Depleting Substances include CFCs, HCGCs, halons and others used in refrigerants, fire extinguishing systems and chemicals (sterilants and solvents).
- xix. Electric motor and pump: Use high efficiency motors and pumps, whenever possible. Targeting 25% better than Canadian 2011 NECB performance curves for motors and pumps.
- xx. Improved Lighting Efficiency: As budgets allow, high efficiency lighting technology and controls is preferred for all new installations, please refer to Section 6.0 Optimize Lighting System for further guidance on lighting guidelines.
- xxi. Lighting Levels: Refer to the IESNA standards for target lighting levels depending on building type and room function. In addition, please refer to Section 6.0 Optimize Lighting System for further guidance on lighting guidelines.
- xxii. On-Site Renewable Energy. Implement renewable energy generation project, when lifecycle costs are effective at facilities to further reduce conventional energy purchases. Refer to NRCan website.



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City of Richmond Building Equipment, Monitoring, and Integration Requirements

- xxiii. Equipment: All equipment, devices, controls needs be well supported by a knowledgeable local technical support staff, local sales representatives and local field service/factory trained representatives to assist in the selection, application and servicing of all equipment. All replacement parts and components need to be readily available (preferred less than 10 day delivery wait time) and cost effective.





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## **4. ENHANCE INDOOR ENVIRONMENTAL QUALITY:**

The intent of this section is to provide a basis for optimizing indoor environments to promote occupant comfort, health, and enjoyment of the space.

- i. Minimum IAQ Performance. Meet or exceed most current ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality.
- ii. Ventilation and Thermal Comfort. Meet or exceed most current ASHRAE Standard 55, Thermal Environmental Conditions for Human Occupancy.
- iii. Filtration Media. Utilize Minimum Efficiency Reporting Value (MERV) of at least 11 for equipment that requires filtration material. Where applicable, GeoPleat or Mini-Pleat filter with MERV 13 must be used. Filter media used in all HVAC equipment needs to be of standard sizing.
- iv. Day lighting and lighting Controls. Automated lighting controls (occupancy/vacancy sensors with manual-off capability) are provided for appropriate spaces including restrooms, conference and meeting rooms, employee lunch room, training rooms and offices. Where ever possible and feasible there should be no on schedule for DDC controlled lighting and occupancy sensors should be used to solely recognize inactivity, with switches used to turn lights on.
- v. Low-Emitting Materials. Use low emitting materials for building modifications, maintenance, and cleaning. In particular, specify the following materials and products to have low pollutant emissions: composite wood products, adhesives, sealants, interior paints and finishes, solvents, carpet systems, janitorial supplies and furnishings.
- vi. Environmental Tobacco Smoke Control. Prohibit smoking within and in the vicinity of the building as per the City of Richmond Public Health Protection Bylaw, Worker Compensation Board (WCB) Occupational Health and Safety Regulations, and Vancouver Costal Health Authority regulations.



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## 5. INTEGRATE BUILDING AUTOMATION SYSTEMS:

The intent of this section is to provide a basis for optimizing the City's building control and energy monitoring capacity to maximize maintenance and operational efficiency, and efficient building resource use. In addition, this section will be used to standardize the City's DDC systems and graphic interface in new and existing buildings.

- i. Prequalified Supply and Installation Contractors: One of the City's prequalified Supply and Installation Contractors for Direct Digital Controls (DDC) Systems must be used for the mechanical and lighting control of City owned and/or operated space.
- ii. Lighting Control: Lighting control is to be tied into separate DDC controllers (unless exempted by the City where in they may be tied in to HVAC DDC controllers), which will be provided by one of the prequalified contractors, with the location and number to be specified by the Electrical Design Consultant as part of the electrical design tender package.
- iii. DDC Graphics and Monitoring: Graphics for the operator interface must be prepared to meet City requirements, which highlight energy efficiency and comfort. Graphic functionality for energy use monitoring will include, but is not limited to, energy use breakdown between electricity and natural gas, further segregation of each fuel type by each functional end use (e.g. ventilation, cooling, heating, pumping, lighting, plug loads, etc. – note that this requires tagging of end use into multiple categories), and by specific systems and equipment. The operator interface for City will run on the City's web-servers. This work must be coordinated through the City's IT group to arrange loading of graphics, databases, and for security requirements.
- iv. Energy Data: All energy data collected will be stored on the City's Sequel Server. The City will provide connection credentials so that the supplied system can store the data. ~~The system must also be capable of delivering this data using BACnet over Ethernet, or BACnet of TCP/IP to third party data repositories capable of accepting BACnet data.~~
- v. DDC Access and Datapoints: The DDC system will be remotely accessed by the City's web based operator interface. Data will be collected at intervals not to exceed 15 seconds for all points during the commissioning process to ensure system stability and tuning. These data points must include measurable variable, manipulated variable, and setpoint variable for each loop, as well as other variable measurements and outputs. VPN network connectivity will be provided by the Supply and Installation Contractor for secure access of sufficient bandwidth to support this.
- vi. Energy Use Monitoring: Any energy use monitoring shall be done through sub-meters that are BACnet enabled, or through virtual metering.
- vii. Water Metering and Monitoring: A water meter will provide instantaneous and aggregated water consumption information of each mechanical makeup water system such as cooling tower, chilled water system, heating water system, heat pump system, Geo/ground loop and Solar system. The information will be delivered using BACnet over MSTP, BACnet over Ethernet, or BACnet over TCP/IP.





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**ADMINISTRATIVE PROCEDURE**

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City of Richmond Building Equipment, Monitoring, and Integration Requirements

## **6. OPTIMIZE BUILDING LIGHTING SYSTEMS:**

Corporate lighting guidelines and requirements are intended to provide the basis for optimizing building interior and exterior lighting controls and associated electrical use, and to standardize the type of lighting used depending on its function.

### **General Guidelines**

- i. All interior building lighting shall be supplied from 120 volt power systems.
- ii. Lighting design shall incorporate the principles of sustainability and its products and systems shall be energy conserving, long life, have a low cost of ownership and be accessible for service and maintenance.
- iii. For interior building lighting solutions, Light Emitting Diode (LED) lighting is preferred.
- iv. For exterior lighting applications (wall mounted fixtures, low mast light fixtures in parking lot), LED lighting is preferred.
- v. Daylight harvesting opportunities shall be implemented in areas where natural daylight is available.
- vi. Uniformity and low brightness contrast shall be achieved by judicious use of luminaires and their locations.
- vii. All lighting shall be designed to suit the task and task location rather than the general lighting. The most current ASHRAE 90.1, IESNA and WorkSafeBC standards shall be taken into consideration and photometric calculations submitted where requested.
- viii. The designer shall take into account 4 to 5 year fluorescent lighting group relamping program, if applicable. All maintenance factors shall be maximized in due respect to the anticipated clean environment in the facilities.
- ix. When mounting luminaires in high ceiling spaces, consideration must be given to ensure access for maintenance activities. Indoor lighting shall be accessible either from ladders on flat surfaces such as floors or stair landings or from powered lifts with a maximum lift of 6.1 m. Building access, floor construction, and elevators shall permit entry and use of existing standard lift equipment for proper and safe maintenance. If special equipment is required for lighting maintenance, then the consultant shall, prior to tender, prepare and submit a Lighting System Maintainability Plan to the City of Richmond for review and approval and it shall contain documentation describing the special equipment, access arrangements for special equipment, and a maintenance schedule and spare parts list.
- x. The lighting design proposed for all public areas such as corridors and stairways shall ensure the life safety of building occupants at all times and shall also minimize lighting energy required to zero, if possible, when the building is un-occupied. (i.e. lights off until occupancy has been detected or an emergency has occurred). A portion of the lighting fixtures shall be wired to an emergency power panel if an emergency generator is available. Lighting circuits fed from emergency power panels shall be arranged so that they may be switched or dimmed.



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- xi. In general, where feasible and economical LED lighting is preferred for all interior spaces. It is preferred for interior LED luminaires, such as troffers, that the driver be mounted in an easily accessible location i.e. not behind the luminaire, so as to reduce maintenance time if replacement is needed.

If there is not a strong business case for interior LED lighting, then linear fluorescent lighting is preferred. Linear fluorescent luminaires shall be equipped with 120 volt program start electronic ballasts and T8-25 watt lamps or with T8-32 watt lamps in low temperature locations. Bent 'U' tube fluorescent luminaires are not acceptable. Lighting solution proposals using T5 linear fluorescent systems are not acceptable. When required in high ceiling areas, T5 High Output (HO) solutions are acceptable. Suspended luminaires shall be direct/indirect. Full indirect suspended luminaires are not acceptable.

- xii. Non-linear specialty fixtures such as pot lights, cylinders, wall sconces, wall washers and other decorative lighting shall be minimized and shall not exceed 10% of the total quantity of fixtures in the building project. When used, it is preferred that these luminaires not be enclosed and incorporate vertically aligned medium base screw-in LED lamps.
- xiii. HID fixtures such as Metal Halide (MH) or High Pressure Sodium (HPS) are not acceptable.

## Lamp and Ballast Guidelines

- i. Use of LED lamps is encouraged and as substitutes for traditional applications involving CFL, MR-16, PAR 20, PAR 30, BR30, PAR 38 lamps, and linear fluorescent lamps. LED lamps shall be Energy Star rated.
- ii. Lamps shall be the longest life available. Preference will be given to lamps and lighting containing the lowest amount of mercury and other toxic components.
- iii. If applicable, it is preferred that T8 fluorescent lamps be extra-long life or extended life lamps rated for 40,000 hours operation with 3 hours per start
- iv. T8 - 25 watt lamps with 3500° K color temperature shall be the typical lamp used for linear fluorescent lighting.
- v. T8 – 32 watt High Lumen fluorescent or LED lamps shall be the typical lamp used in low temperature locations.
- vi. T5 HO fluorescent lamps shall be extra-long life or extended life lamps.
- vii. Where T5 HO lamps are used in enclosed fixtures, lamps rated for higher temperatures shall be used.
- viii. All fluorescent lighting ballasts shall operate from 120 volt input voltage and shall be program start electronic type with standard ballast factor. Ballasts shall have parallel lamp operation. Acceptable manufacturers are.
- ix. Ballast output frequency shall be greater than 42 kHz.



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- x. Dimming ballasts shall be program start with either line voltage or 0-10 volt control.
- xi. Ballasts shall have lamp end-of-life detection and shutdown circuitry that meets the most current ANSI standards.

### Energy Allowances

- i. All interior lighting shall not exceed the energy density limits as defined in the most current ASHRAE 90.1 lighting power densities standard, using either the whole building area method or the space by space evaluation method. For the whole building area evaluation method, the standard is currently 0.90 watt per square foot.
- ii. All exterior building lighting shall not exceed the lighting power density limits as defined in the most current ASHRAE 90.1 standard.

### Lighting Controls

- i. All interior lighting (including stairwells) shall have controls such that when the lighting is not needed, it will automatically be either turned off or dimmed to a low output condition, and shall conform to the most current relevant ASHRAE 90.1 standard.
- ii. All lighting control systems shall be fully tested and commissioned and a Lighting System Commissioning Report shall be prepared and certified by a responsible professional as per the most current relevant ASHRAE 90.1 standard.
- iii. As per the DDC integration requirements, where low voltage relay controls are provided for new building projects they shall include a BACnet compatible DDC interface device to allow for all scheduling functions related for the lighting systems to be controlled by the buildings DDC system.
- iv. All exterior building mounted lighting and exterior building area lighting shall be controlled by photocell or astronomical time clock. Lighting that may be powered from the building electrical system shall be controlled by the DDC.
- v. Occupancy sensors shall be dual technology type with both Passive Infrared (PIR) and acoustic/ultra-sonic sensors, and may be either line voltage or low voltage types. Low voltage occupancy sensors with 1 or 2 poles and local power packs are preferred. Slave power packs are not acceptable.
- vi. Offices shall have light control switches at all entrances, exits and vestibules. These interior spaces shall also have occupancy sensors integrated with the control switch or mounted at a high level in a corner and arranged for semi-automatic operation such that manual operation of the local switches is required to energize the lighting while occupancy sensors and local switches will de-energize the lighting. Large spaces may need more than one sensor.
- vii. Corridors, lobbies and similar public spaces shall have occupancy sensors, mounted at high levels, and arranged for full automatic operation.



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- viii. Occupancy sensors are not permitted in interior spaces that may be or may become hazardous, such as electrical and mechanical service rooms.
- ix. Where feasible, all offices, corridors, stairways and other public spaces shall incorporate daylight harvesting via use of interior mounted photocells and arranged to take advantage of free illumination while maintaining acceptable minimum illumination levels within the space.
- x. LED dimmers shall be compatible with the LED lamps used and their drivers.

## Exit Signage

- i. Exit lighting shall be provided in accordance with the BC Building Code and the Canadian Electrical Code as amended by BC Electrical Safety regulations.
- ii. All exit signs shall be illuminated by LED light sources and shall have an emergency power NiCad battery.
- iii. Exit signs shall be powered at 120 volts from emergency power panels, if available.
- iv. The "Running Man" style EXIT sign that conforms to the CAN/ULC-S572 standard is preferred.

## Emergency Lighting

- i. Emergency lighting must be installed in accordance with the latest revision of the B.C. Building Code and City of Richmond's Bylaw No. 8306 (Fire Protection and Life Safety).
- ii. Provide standby emergency generator if motor loads require emergency power.
- iii. All battery pack lighting, remote heads and exit lights shall be LED type and manufactured by 'Ready-Lite' or an approved equal. 'Ready-Lite' is available from local suppliers and shall be stocked by City of Richmond. It is important that City of Richmond have stock in standard sizes so that repairs can be done quickly and effectively as required for the life safety system.
- iv. The battery packs shall be long life type and either 12 volts DC or 24 volts DC and shall be in accordance with CSA C22.2 No. 141.
- v. All battery packs shall be mounted on the wall using anchors capable of supporting the weight, or mounted on an appropriately sized shelf, supplied from 'Ready-Lite' or an approved equal.
- vi. Generator and Electrical rooms shall be provided with an emergency battery lighting pack.
- vii. If a 12 volt DC battery lighting pack is used for emergency lighting power, it shall be rated for 36 watt to 360 watt and should not be self-testing.



# City of Richmond

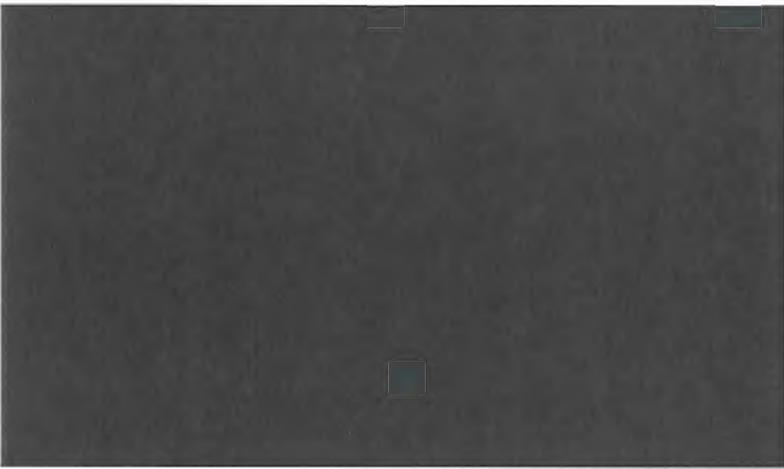
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- viii. If a 24 volt DC battery lighting pack is used for emergency lighting power, it shall be either a 360 watt unit or a 720 watt unit, and should not be self-testing.
- ix. For both 12 volt DC and 24 volt DC systems, the heads and remote heads shall be 9 watts each.
- x. Battery packs that are fed from a 120 volt AC. source shall have a 120 volt duplex receptacle mounted adjacent so that the battery pack can be plugged into the receptacle, to facilitate testing and replacement when needed.



## **Appendix C**

City of Richmond Building  
Lighting Guidelines

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## 1.0 GENERAL

### 1.1 Related City of Richmond Guidelines

- .1 High Performance Building Policy
- .2 City of Richmond Sustainable Operation and Maintenance Requirements

### 1.2 Coordination Requirements

- .1 City of Richmond Facilities
- .2 City of Richmond Project Development
- .3 City of Richmond Information Technology

## 2.0 MATERIAL AND DESIGN REQUIREMENTS

### 2.1 General

- .1 All interior building lighting shall be supplied from 120 volt power systems.
- .2 Lighting design shall incorporate the principles of sustainability and its products and systems shall be energy conserving, long life, have a low cost of ownership and be accessible for service and maintenance.
- .3 For interior building lighting solutions, preference shall be given to Light Emitting Diode (LED) and linear fluorescent light sources.
- .4 For exterior lighting applications (wall mounted fixtures, low mast light fixtures in parking lot), preference shall be given to LED light sources. Fluorescent light sources may be used selectively.
- .5 Daylight harvesting opportunities shall be implemented in areas where natural daylight is available.
- .6 Uniformity and low brightness contrast shall be achieved by judicious use of luminaires and their locations.
- .7 All lighting shall be designed to suit the task and task location rather than the general lighting. ASHRAE 90.1-2010, IESNA and WorkSafeBC guidelines shall be taken into consideration and photometric calculations submitted where requested.
- .8 The designer shall take into account 4 to 5 year fluorescent lighting group relamping program. All maintenance factors shall be maximized because of the expected clean environment in the facilities.
- .9 When mounting luminaires in high ceiling spaces, consideration must be given to ensure access for maintenance such as lamp and ballast changing. Indoor lighting shall be accessible either from ladders on flat surfaces such as floors or stair landings or from powered lifts with a maximum lift of 6.1 m. Building access, floor construction, and elevators shall permit entry and use of existing standard lift equipment for proper and safe maintenance. If special equipment is required for lighting maintenance, then the consultant shall, prior to tender, prepare and submit a Lighting System Maintainability Plan to the City of Richmond for review and approval and it shall contain documentation describing the special equipment, access arrangements for special equipment, and a maintenance schedule and spare parts list.

- .10 The lighting design proposed for all public areas such as corridors and stairways shall ensure the life safety of building occupants at all times and shall also minimize lighting energy required to zero, if possible, when the building is un-occupied. (I.e. lights off until occupancy has been detected or an emergency has occurred). A portion of the lighting fixtures shall be wired to an emergency power panel if an emergency generator is available. Lighting circuits fed from emergency power panels shall be arranged so that they may be switched or dimmed.

- .11 In general, where feasible and economical LED lighting is preferred for interior spaces. It is preferred for interior LED luminaires, such as troffers, that the driver be mounted in an easily accessible location i.e. not behind the luminaire, so as to reduce maintenance time if replacement is needed.

If there is not a strong business case for interior LED lighting, then linear fluorescent lighting is preferred. Linear fluorescent luminaires shall be equipped with 120 volt program start electronic ballasts and T8-25 watt lamps or with T8-32 watt lamps in low temperature locations. Bent 'U' tube fluorescent luminaires are not acceptable. Lighting solution proposals using T5 linear fluorescent systems are not acceptable. When required in high ceiling areas, T5 High Output (HO) solutions are acceptable. Suspended luminaires shall be direct/indirect. Full indirect suspended luminaires are not acceptable.

- .12 Non-linear specialty fixtures such as pot lights, cylinders, wall sconces, wall washers and other decorative lighting shall be minimized and shall not exceed 10% of the total quantity of fixtures in the building project. When used, it is preferred that these luminaires not be enclosed and incorporate vertically aligned medium base screw-in LED lamps.
- .13 HID fixtures such as Metal Halide (MH) or High Pressure Sodium (HPS) are not acceptable.

## 2.2 Lamps

- .1 Lamps shall be the longest life available. Preference will be given to fluorescent lamps containing the lowest amount of mercury.
- .2 It is preferred that T8 fluorescent lamps be Extra Long Life or Extended Life lamps rated for 40,000 hours operation with 3 hours per start.

Preferred manufacturers are: General Electric, Osram Sylvania, or Philips

- .3 T8 - 25 watt lamps with 3500° K color temperature shall be the typical lamp used for linear fluorescent lighting.
- .4 T8 – 32 watt High Lumen fluorescent or LED lamps shall be the typical lamp used in low temperature locations.
- .5 T5 HO fluorescent lamps shall be Extra Long Life or Extended Life lamps.

Preferred manufacturers are: General Electric, Osram Sylvania, or Philips.

- .6 Where T5 HO lamps are used in enclosed fixtures, lamps rated for higher temperatures shall be used.

Preferred manufacturers are Philips Extreme Temperature series or Sylvania Constant series.

- .7 Use of LED lamps is encouraged and as substitutes for traditional applications involving CFL, MR-16, PAR 20, PAR 30, BR30, PAR 38 lamps, and linear fluorescent lamps when economical. LED lamps shall be Energy Star rated.

### 2.3 Ballasts

- .1 All fluorescent lighting ballasts shall operate from 120 volt input voltage and shall be program start electronic type with standard ballast factor. Ballasts shall have parallel lamp operation. Acceptable manufacturers are: General Electric, Osram Sylvania, Philips/Advance or Universal.
- .2 Ballast output frequency shall be greater than 42 kHz.
- .3 Dimming ballasts shall be program start with either line voltage or 0-10 volt control.
- .4 Ballasts shall have lamp end-of-life detection and shutdown circuitry that meets ANSI standards.

### 2.4 Energy Allowances

- .1 All interior lighting shall not exceed the energy density limits as defined in ASHRAE 90.1-2010 section 9.5 (Building Area Method) or 9.6 (Space by Space Method).

For the Building Area Method, the energy density limit is 0.90 watt per square foot.

- .2 All exterior building lighting shall not exceed the energy density limits as defined in ASHRAE 90.1-2010 section 9.4.3.

### 2.5 Lighting Controls

- .1 All interior lighting (including stairwells) shall have controls such that when the lighting is not needed, it will automatically be either turned off or dimmed to a low output condition, and shall conform to the new ASHRAE 90.1-2010 standard (sections 9.4.1, 9.4.2)
- .2 All lighting control systems shall be fully tested and commissioned and a Lighting System Commissioning Report shall be prepared and certified by a responsible professional as per ASHRAE 90.1-2010 standard (section 9.4.4)
- .3 Where low voltage relay controls are provided for new building projects they shall include a BACnet compatible Building Management System (BMS) interface device which shall be wired to the local BMS control panel. This will ensure that all scheduling functions related to lighting systems will be under the control of the BMS system.
- .4 All exterior building mounted lighting and exterior building area lighting shall be controlled by photocell or astronomical time clock. Lighting which may be powered from the building project electrical system shall be under the control of the BMS scheduling system.
- .5 Occupancy sensors shall be dual technology type with both Passive Infrared (PIR) and acoustic/ultra-sonic sensors, and may be either line voltage or low voltage types. Low voltage occupancy sensors with 1 or 2 poles and local power packs are preferred. Slave power packs are not acceptable.

Preferred manufacturers are Watt stopper, Sensor Switch, Leviton, or Hubbell

- .6 Offices shall have light control switches at all entrances, exits and vestibules. These interior spaces shall also have occupancy sensors integrated with the control switch or mounted at a high level in a corner and arranged for semi-automatic operation such that manual operation of the local switches is required to energize the lighting while occupancy sensors and local switches will de-energize the lighting. Large spaces may need more than one sensor.
- .7 Corridors, lobbies and similar public spaces shall have occupancy sensors, mounted at high levels, and arranged for full automatic operation.
- .8 Occupancy sensors are not permitted in interior spaces that may be or may become hazardous, such as electrical and mechanical service rooms.
- .9 All, offices, corridors, stairways and other public spaces shall incorporate daylight harvesting via use of interior mounted photocells and arranged to take advantage of free illumination while maintaining acceptable minimum illumination levels within the space.
- .10 LED dimmers shall be compatible with the LED lamps used and their drivers.

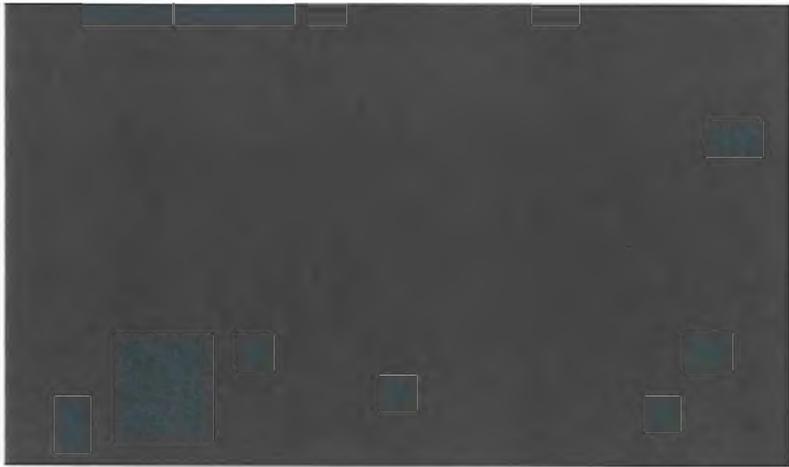
## 2.6 Exit Signage

- .1 Exit lighting shall be provided in accordance with the BC Building Code and the Canadian Electrical Code as amended by BC Electrical Safety regulations.
- .2 All exit signs shall be illuminated by LED light sources and shall have an emergency power NiCad battery.
- .3 Exit signs shall be powered at 120 volts from emergency power panels, if available.
- .4 The “Running Man” style EXIT sign which conforms to the CAN/ULC-S572 standard shall be used.

## 2.7 Emergency Lighting

- .1 Emergency lighting must be installed in accordance with the latest revision of the B.C. Building Code and City of Richmond’s Bylaw No. 8306 (Fire Protection and Life Safety).
- .2 Provide standby emergency generator if motor loads require emergency power.
- .3 All battery pack lighting, remote heads and exit lights shall be LED type and manufactured by ‘Ready-Lite’ or approved equal. ‘Ready-Lite’ is available from local suppliers and shall be stocked by City of Richmond. It is important that City of Richmond have stock in standard sizes so that repairs can be done quickly and effectively as required for the life safety system.
- .4 The battery packs shall be long life type and either 12 volts DC or 24 volts DC and shall be in accordance with CSA C22.2 No. 141.
- .5 All battery packs shall be mounted on the wall using anchors capable of supporting the weight, or mounted on an appropriately sized shelf, supplied from ‘Ready-Lite’ or approved equal.

- .6 Generator and Electrical rooms shall be provided with an emergency battery lighting pack.
- .7 If 12 volt DC is used they shall be rated for 36 watt to 360 watt and should not be self testing as clients do not understand the self test and call in a trouble call unnecessarily.
- .8 If 24 volts DC are used they shall be either a 360 watt unit or a 720 watt unit only. They shall also be a basic model without meters or self testing.
- .9 For both 12 volt DC and 24 volt DC systems, the heads and remote heads shall be 9 watts each.
- .10 Battery packs that are fed from a 120 volt AC. source shall have a 120 volt duplex receptacle mounted adjacent so that the battery pack can be plugged into the receptacle. This is to facilitate testing and replacement when needed.



## Appendix D

City of Richmond Direct Digital  
Control (for Buildings) and Energy  
Monitoring Guidelines



# City of Richmond

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City of Richmond Direct Digital Control and Energy Monitoring Guideline – Non City managed new construction

## City of Richmond Direct Digital Control (for Buildings) and Energy Monitoring Guidelines – Non City managed new construction for City owned spaces.

### 1. REQUIREMENTS:

- i. One of the City's two prequalified Supply and Installation Contractors for Direct Digital Controls (DDC) Systems must be used for the mechanical and lighting control of City owned and/or operated space – currently either ESC Automation or Control Solutions.
- ii. Lighting control is to be tied into separate DDC controllers, which will be provided by one of the prequalified contractors, with the location and number to be specified by the Electrical Design Consultant as part of the electrical design tender package.
- iii. Graphics for the operator interface must be prepared to meet City requirements, which highlight energy efficiency and comfort. Graphic functionality for energy use monitoring will include, but is not limited to, energy use breakdown between electricity and natural gas, further segregation of each fuel type into energy use of separate end uses, to further segregation of energy use of specific systems and equipment. The operator interface for City will run on the City's web-servers.
- iv. The DDC system will be remotely accessed by the City's web based operator interface. Data will be collected at a maximum of 15 second intervals for all points during the commissioning process to ensure system stability and tuning. VPN network connectivity will be provided by the Supply and Installation Contractor for secure access of sufficient bandwidth to support this.
- v. Any energy use monitoring and billing of a City space, which is located within a building that is not City owned and managed, will be done through sub-meters that are BACnet enabled and not on a pro-rated basis.
- vi. A water meter that is BACnet enabled is required to monitor use of any mechanical makeup water system such as cooling tower, chill water system, heating water system, heat pump system, Geo/ground loop and Solar system.
- vii. A BTU meter that is BACnet enabled is required for the heat pump loop to monitor the energy usage of City space.
- viii. Once the mechanical and lighting DDC points list for the space has been initially defined, the City requests that they are provided to the City along with the mechanical and electrical specifications, to allow for the timely opportunity to review and comment before finalization.
- ix. Lighting, mechanical, and plug loads need to be segregated on separate electrical panels for energy monitoring purposes.



# City of Richmond

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City of Richmond Direct Digital Control and Energy Monitoring Guideline – Non City managed new construction

- x. Once the preliminary electrical directories for each electrical panel have been defined, the City requests that they are provided to the City, to allow for a timely opportunity to review and comment before finalization.
- xi. City personnel or the City's DDC consultant will conduct its own inspections of the system design, installation and functionality, and will prepare its own deficiency lists during the construction process and final inspection. The deficiency lists will need to be corrected prior to City sign off on completion.





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94308  
Tel: 650-321-1071  
Fax: 650-321-1071

SECTION ARCH  
A 100-18 FORMED POINZ

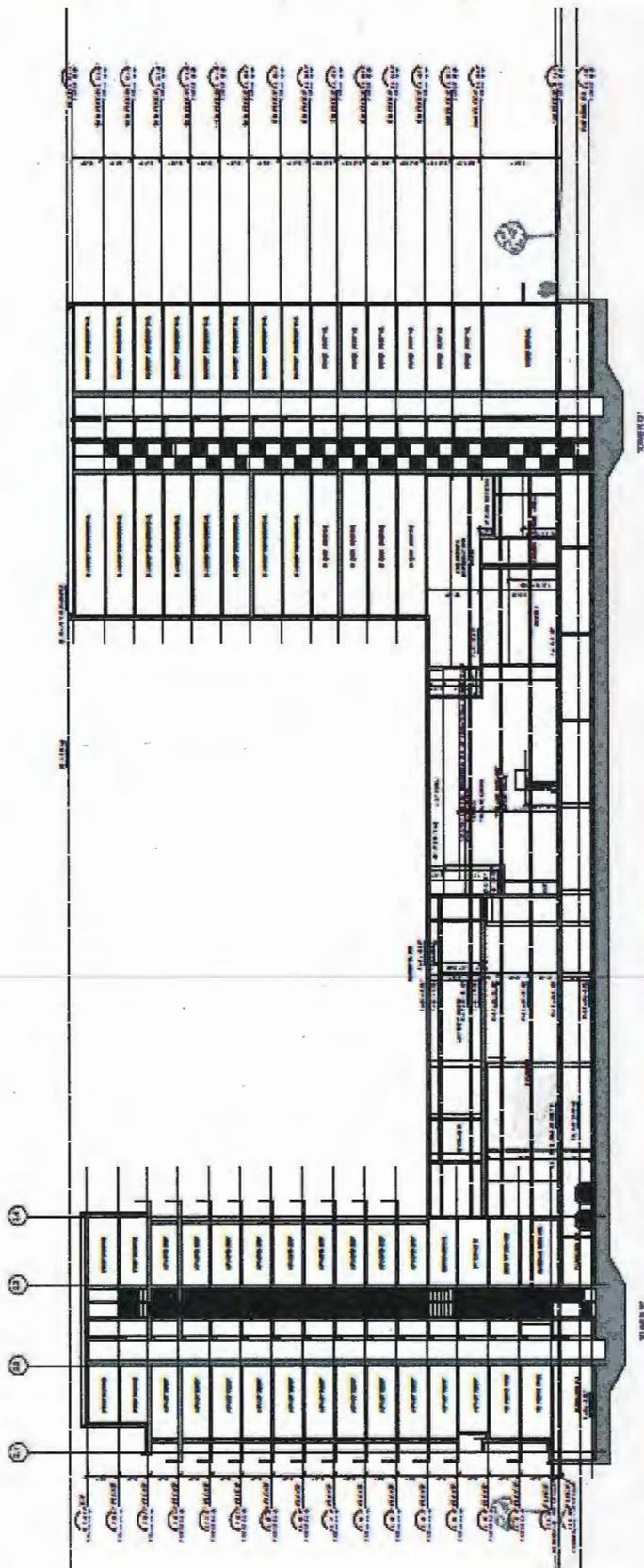
PROJECT  
Yuseneng Seaside  
Yuseneng Seaside  
Development

SITE 1 & 2 (Red Hillview) 100

Section B - B  
Plan 1/32"

JOB NO.  
DRAWN BY: W.T.L.  
DATE: June 15, 2004  
SCALE: 1/32" = 1'-0"  
DESIGNED BY:  
CHECKED BY:  
DATE:  
BY:  
DATE:  
BY:  
DATE:  
DATE:  
DATE:

CC - A-204





## YuanHeng Riverfront Park Conceptual Plan

### Terms of Reference

#### 1. Intent

- a. The area of the waterfront park must be at least 4,276.6 m<sup>2</sup> (1.06 ac), including:
  - i. 8051 River Road;
  - ii. City-owned River Road right-of-way fronting the east side of 8051 River Road; and
  - iii. Unopened City-owned road right-of-way along the south side of 8051 River Road.
- b. The park will provide access to the waterfront to pedestrians and cyclists for circulation and recreational purposes.
- c. The park landscape will make a positive contribution to the Fraser River foreshore ecosystem.
- d. All park elements will be universally accessible.

#### 2. Park Program

- The park area will consist of the existing lot at 8051 River Road, which includes the existing dike, the area of existing River Rd. which will be developed for park purposes, and the unopened road end at the end of Capstan Way. In addition, piers and associated amenities are proposed to project into the river beyond the west lot line of 8051 River Road. The park will provide the following functions:
- a. A paved, 4.0 m. wide combined pedestrian and cycling path on the dike crest;
  - b. A 2.5 m. wide separated pedestrian path that:
    - i. Will provide seating, affording views of the river;
    - ii. May be located below the dike crest but not lower than the existing dike elevation (approximately 3.5 m GSC) in order to provide opportunities for the pedestrians to be closer to the river;
    - iii. May be constructed of a mix of hard surface and granular materials provided that it remains universally accessible.
  - c. Plaza nodes at each street end of sufficient size to allow for safe passage of cyclists and pedestrians and, at the same time, allow for seating and other site furnishings to serve informal gathering and viewing;
  - d. Viewing piers at each road end (Capstan Way and Corvette Way) accessed from the plaza nodes and at dike crest elevation with steel gangways accessing a floating walkway that will create a connection between them on the river;;
  - e. A steel lookout platform with stair access and an elevated covered area with benches;
  - f. Pedestrian and cyclist access to the new dike crest elevation from Capstan Way, River Road and Corvette Way, including interim and ultimate measures;
  - g. All park infrastructure necessary for efficient and effective operation and maintenance including, but not limited to, lighting, irrigation, storm drainage, power and water.

#### 3. Park Design

- a. The park design will be completed by the developer to the satisfaction of the City.
- b. Soft landscape design:
  - i. To provide screening and separation from the development site including trees;
  - ii. To reflect the context of the Middle Arm of the Fraser River including native planting;
  - iii. To include native riparian and intertidal planting in all areas below the new dike crest.
- c. Hard landscape design:
  - i. Detailed design of all elements and the materials used are to reflect and celebrate the waterfront location and character.
- d. Buildings situated outside the parking will be set back at least 30.0 m from the High Water Mark

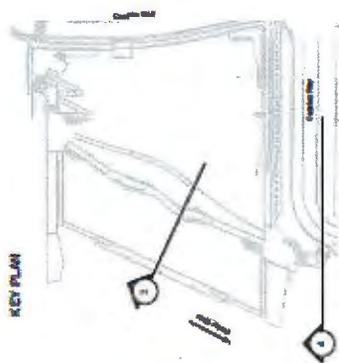
#### 4. Park Maintenance

- a. The dike crest trail shall be of sufficient width to accommodate park maintenance vehicles.
- b. The interim condition shall allow vehicles the ability to safely enter and exit the park area.

Initial \_\_\_\_\_







DATE: 12/12/11  
 DRAWN BY: [Redacted]  
 CHECKED BY: [Redacted]  
 PROJECT: [Redacted]

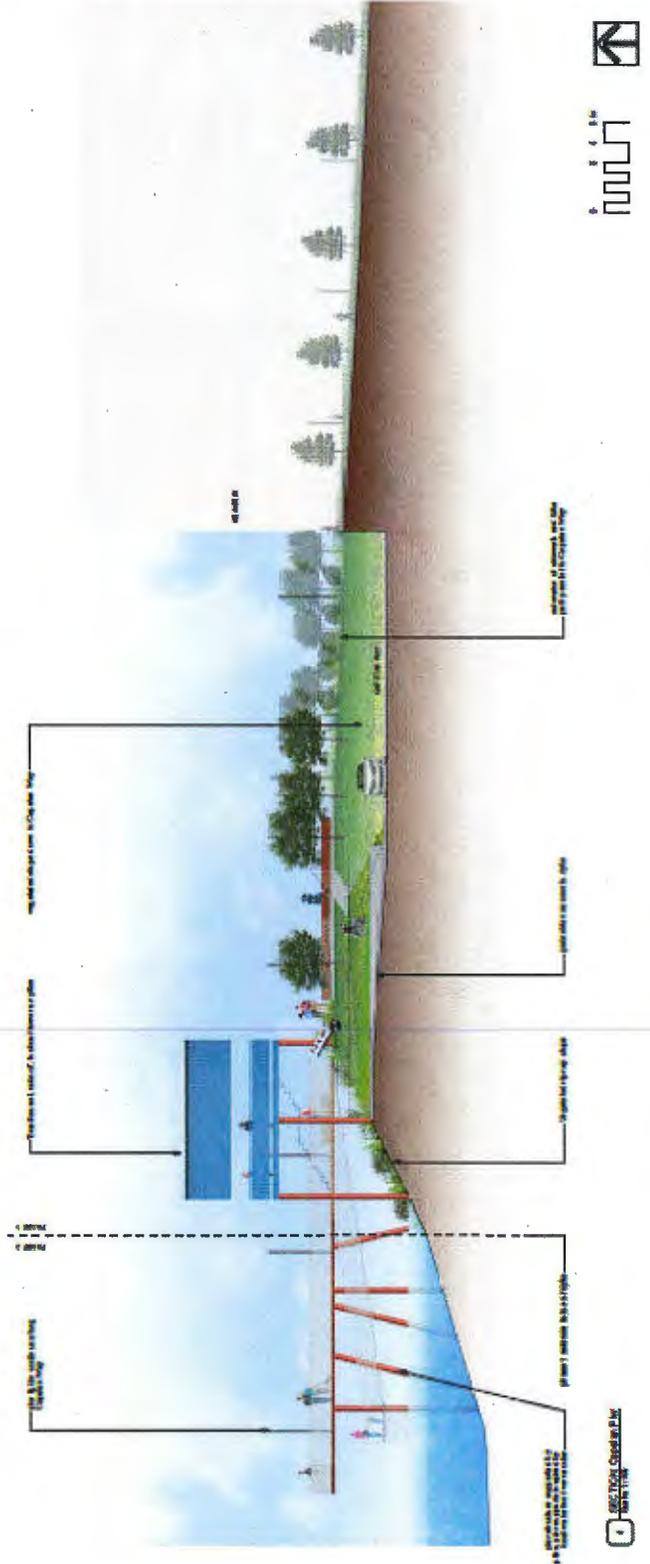


**3** RESTROOM (See Detail)

**4** SHELTER (See Detail)

1. 20' x 30' x 10' structure with 10' x 6' door  
 2. 10' x 10' x 8' structure with 6' x 6' door  
 3. 2' x 8' x 8' structure with 6' x 6' door  
 4. 10' x 10' x 8' structure with 6' x 6' door

PROJECT NAME:  
 LOCATION:  
 DATE:



**4** RESTROOM (See Detail)

**5** SHELTER (See Detail)

1. 20' x 30' x 10' structure with 10' x 6' door  
 2. 10' x 10' x 8' structure with 6' x 6' door  
 3. 2' x 8' x 8' structure with 6' x 6' door  
 4. 10' x 10' x 8' structure with 6' x 6' door

**eta** landscape architecture

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CLIENT: [Redacted]  
 ARCHITECT: [Redacted]  
 LANDSCAPE ARCHITECTURE:  
 [Redacted]

NO.	DESCRIPTION	DATE	BY	CHECKED BY
1	ISSUED FOR PERMITS	12/12/11	[Redacted]	[Redacted]
2	ISSUED FOR CONSTRUCTION			
3	ISSUED FOR AS-BUILT			







**Richmond Official Community Plan Bylaw 9000 and Richmond Official  
Community Plan Bylaw 7100,  
Amendment Bylaw 9593 (RZ 12-603040)  
3031, 3211, 3231, 3291, 3311, 3331, 3351 No. 3 Road,  
8151 Capstan Way, and 8051 and 8100 River Road**

The Council of the City of Richmond, in open meeting assembled, enacts as follows:

1. Richmond Official Community Plan Bylaw 9000 is amended at Attachment 1 to Schedule 1, 2041 OCP Land Use Map, for those areas marked “A” and “B” on “Schedule A attached to and forming part of Bylaw 9593”, by designating area “A” as “Park” and area “B” as “Mixed Use”.
2. Richmond Official Community Plan Bylaw 7100, in Schedule 2.10 (City Centre Area Plan), is amended by:
  - 2.1 On page 2-6, on the City Centre Neighbourhoods & Village Areas Map, in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, repealing the “Existing Parks, Planned Parks & Open Space” designation and designating the land identified as “Park” on “Schedule B attached to and forming part of Bylaw 9593” as “Existing Parks, Planned Parks & Open Space”.
  - 2.2 On page 2-13, on the Jobs & Business Concept Map, in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, extending the “Key Mixed-Use Areas & Commercial Reserve” designation to include that area west of Corvette Way identified as “Urban Centre T5 (45 m)” on “Schedule B attached to and forming part of Bylaw 9593”.
  - 2.3 On page 2-17, on the Key Commercial Areas Map, in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, extending the “Mixed-Use Core” designation to include that area west of Corvette Way indicated as “Urban Centre T5 (45 m)” on “Schedule B attached to and forming part of Bylaw 9593”.
  - 2.4 On page 2-27, on the Street Network Map (2031), in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, revising the “Minor Streets” designation connecting Corvette Way and No. 3 Road as indicated on “Schedule B attached to and forming part of Bylaw 9593”.
  - 2.5 On page 2-32, on the Key Street Improvements Map (2031), in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, revising the “New East-West Streets” designation connecting Corvette Way and

- No. 3 Road as indicated on "Schedule B attached to and forming part of Bylaw 9593".
- 2.6 On page 2-42, on the Goods Movement & Loading Map (2031), in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, revising the "Limited on-street" designation connecting Corvette Way and No. 3 Road as indicated on "Schedule B attached to and forming part of Bylaw 9593".
  - 2.7 On page 2-51, on the Public Art Opportunities Map, in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, repealing the "Neighbourhood Park (Future to 2031)" designation and designating the land identified as "Park" on "Schedule B attached to and forming part of Bylaw 9593" as "Neighbourhood Park (Future to 2031)".
  - 2.8 On page 2-60, on the A Base for Building a Living Landscape Map, in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, repealing the "Existing Greenways, Planned Greenways, Linear Parks & Green Links" designation and designating the land identified as "Park" on "Schedule B attached to and forming part of Bylaw 9593" as "Existing Greenways, Planned Greenways, Linear Parks & Green Links".
  - 2.9 On page 2-65, on the Base Level Parks & Open Space Map (2031), in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, repealing the "Neighbourhood Park (Future to 2031)" designation and designating the land identified as "Park" on "Schedule B attached to and forming part of Bylaw 9593" as "Neighbourhood Park (Future to 2031)".
  - 2.10 On page 2-68, on the Neighbourhood Parks Map, in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, repealing the "Neighbourhood Park (Future to 2031)" designation and designating the land identified as "Park" on "Schedule B attached to and forming part of Bylaw 9593" as "Neighbourhood Park (Future to 2031)".
  - 2.11 On page 2-109, on the Maximum Building Height Map, in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River
    - a) Repealing the "9 m (30 ft.)" designation and designating the land identified as "Park" on "Schedule B attached to and forming part of Bylaw 9593" as "Park"; and
    - b) Repealing the "Park" designation and designating the land identified as "Urban Centre T5 (45 m)" on "Schedule B attached to and forming part of Bylaw 9593" as "45 m (148 ft.)".
  - 2.12 On page 2-113, on the Tower Spacing & Floorplate Size Map, in the area bounded by Sea Island Way, No. 3 Road, Capstan Way and the Middle Arm of the Fraser River, extending the "24 m (79 ft.)" designation to include the area west of Corvette























