

Bike Share Docking Stations – Urban Design Committee Application

Project Purpose:

The City of Richmond is prepared to launch a public bike share system (System), having executed a contract in February 2016 with Bewegen Technologies (Bewegen), the preferred equipment vendor and their operations subcontractor, Corps Logistics following an RFP procurement and selection process conducted over the prior year.

Cities throughout America have launched public bike share systems over the past several years. Bike share systems provide a fleet of bikes at docking stations throughout downtown and surrounding densely populated and mixed-use areas of the city. Bike share is essentially “bike transit” and serves as a means to provide people a convenient travel mode that is readily available, while negating the need to have a personal bike available for short trips around the city. Bike share provides a middle mode that fills the gap for short trips that are too far to walk yet too short to necessitate driving. Bike share also serves a “first and last mile” solution, allowing easier access to transit and negating the need for some transit transfers, or extending the effective range of transit since bus riders tend to be willing to walk ¼ mile to and from transit, while biking expands that range by a factor of 4 or more.

Bike share incorporates a range of technologies that make accessing a bike quick and easy. Users can find available bikes throughout the system online or via a Smartphone app. Regular users that sign up for a membership can quickly check out a bike with the swipe of an RFID member card or by using their Smartphone. Casual users are non members such as tourists or those that want to try the system before committing to a membership. These users are able to also utilize the Smartphone app to check out a bike, or by purchasing a pass and RFID card at payment kiosks that will be included at some of the docking stations in areas more likely to be frequented by casual users.

Project Background:

The City began investigating bike share approximately four years ago and pursued state and federal funding to offset the initial capital costs for the equipment. The bike share industry has been undergoing a significant evolution over the past couple years, moving from what is referred to as “third generation” to “fourth generation” or “beyond third generation” systems with technology advances that create greater flexibility for the users while providing cities with more robust data related to use of the system that can serve as an infrastructure planning tool.

Bewegen is currently the only provider of public bike share systems that have the option of electric pedal-assist (pedelec) bikes. The first phase of the System launch will include only 8-speed geared bicycles. The second phase and System expansion in spring 2017 will add pedelec bicycles. With the addition of pedelec bicycles the System will also expand into areas of the City with steeper hills as the pedelec bikes make bike share in these areas more attractive and feasible for a broader range of users.

Project Budget and Funding Sources:

The City received grant funding from the federal Congestion Mitigation and Air Quality Program for both capital costs and the first year of operational costs. The City was required to provide a 20% match for

the first phase of the system launch. This summer the City will launch the initial system with a fleet of 220 bikes and 20-22 docking stations. This first phase will be focused primarily in the CBD and surrounding areas including Carver, Jackson Ward, and limited areas of the Fan. This phase is currently funded at \$1.34 million including the CMAQ funding and City CIP contribution. Another \$1.9 million is available from CMAQ for an expansion of the system which is tentatively planned for the spring of 2017. The expansion is anticipated to at least double the number of docking stations, expanding the service area as well as adding station density where needed. During expansion the number of bikes will also more than double and will include pedelec bikes. Areas targeted during the expansion include Church Hill/Union Hill, Shockoe Bottom, parts of north side including VUU, and Manchester. System sponsorship is being pursued to allow a self-sustaining operation that requires minimal or no city subsidy for ongoing operations while also keeping user fees affordable.

Construction Program Description:

The System will utilize both solar and grid-tied docking stations to allow for recharging of the bike batteries and to operate the payment kiosks. When the system expands to pedelec bikes the charging demands will be greater at the docking stations resulting in the need for a number of stations to utilize electrical connections. There is a large solar canopy that can be employed to charge the pedelec bikes, however the costs are significantly higher, as are the overhead clearance and spatial requirements, as well as solar exposure considerations. Electric tie-ins will be subject to anticipated charging demand, solar exposure, and nearby stations that have electric connections which facilitate minor bike redistribution needs to ensure adequate charging.

Estimated Project Construction Start Date:

The system launch is anticipated for late summer 2016. Construction is minimal, only requiring some electrical connections and physical placement of the docking stations. Several fasteners will be used (concrete wedge anchors) to ensure that the docking stations are not moved or shifted except when required by City or operational needs. Installations on brick sidewalks will use a metal base-plate to eliminate the need to use anchors. The docking stations are modular and capacity can be increased or decreased by adding or removing individual docks. Minor sidewalk repair may be needed in isolated instances to ensure a level surface on which to place the equipment.

Other Considerations:

Each station will employ a wayfinding and advertisement panel which is retro-lit to minimize electrical use and emission of ambient lighting. The wayfinding maps will employ the same design elements as the City's wayfinding signs to ensure uniformity. Each location is being vetted for appropriate clearance to parked vehicles, utilities, driveways, building entrances, etc. and to maintain adequate pedestrian zones along the sidewalk where they are placed. In some instances the stations will be placed curbside to eliminate conflicts with pedestrian access along the sidewalk. This type of placement is common throughout the US and is employed at locations with low traffic speeds and volumes and adequate clearance from the travel lane. DPW and PDR have coordinated on these conditions to arrive at consensus on appropriate clearances.

Appendices:

- I. Bewegen station dimensional drawings
- II. Examples of Bewegen stations
- III. System Map – Phase I and Final Proposed Station Locations

Appendix I – Bewegen station dimensional drawings

The attached drawings provide the spatial dimensions of the docking stations, including bikes when docked. The docks can be configured in different arrangements when spatial conditions require other than a linear arrangement (e.g. back-to-back docks to fit a square area). The drawings represent a common 12-bike layout, both with 90 degree and 35 degree angled docks. Due to the scalability some docking stations will have more docks, but a 12-dock station is typically the smallest configuration. The drawings also include the dimensions for the full solar canopy that can be used for charging pedelec bikes. The basic solar panel arrangement atop the kiosk is capable of charging the electronics for the kiosk, totem, and non-pedelec bikes.

Appendix II – Examples of Bewegen stations

The following are examples of docking stations and bikes from other Bewegen bike share systems.



Stations with solar kiosk and wayfinding panel



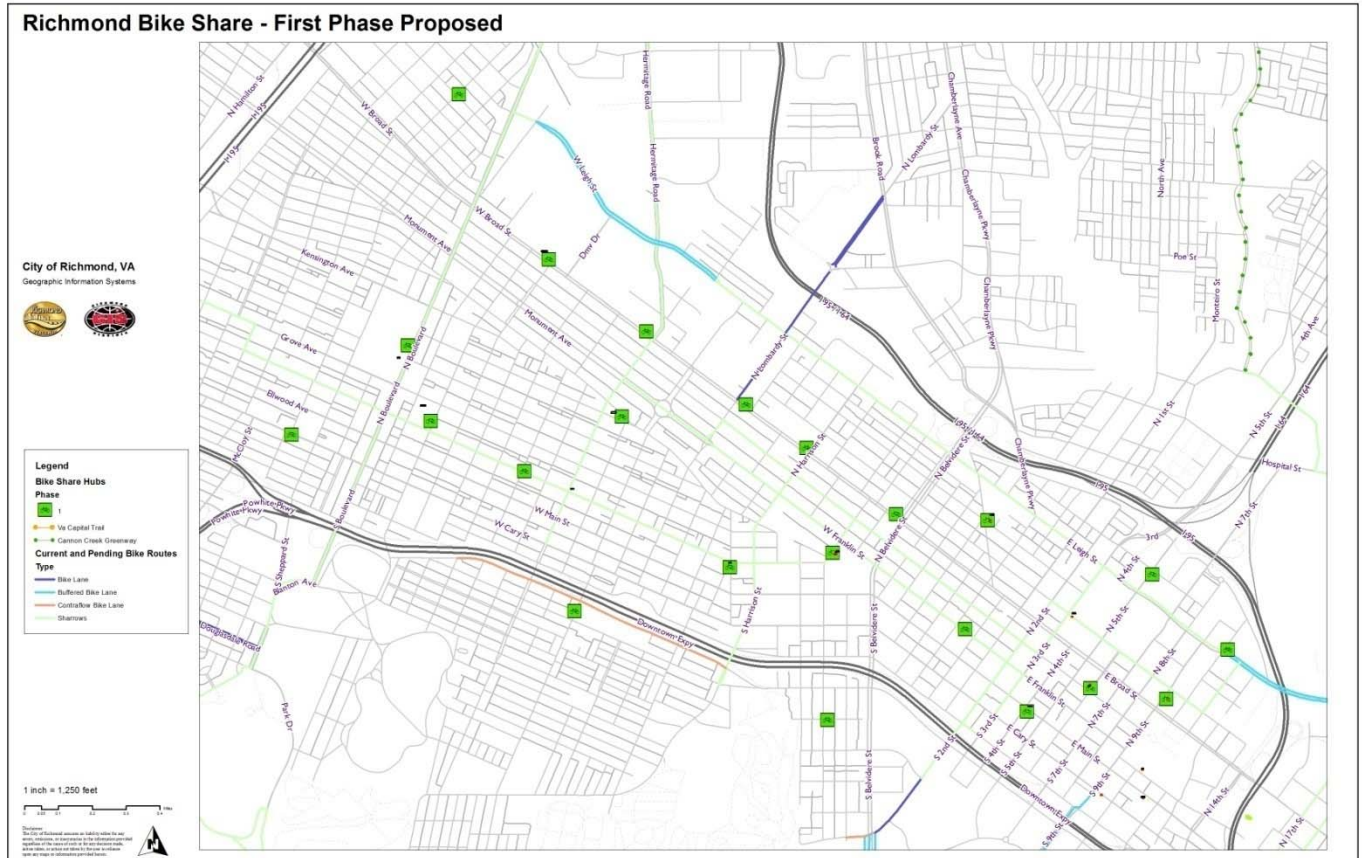
Station with back-to-back dock configuration



Solar charging canopy for pedelec (Phase II)

Appendix III – System Map – Phase I and Final Proposed Station Locations

The following map indicates the final proposed locations of the first phase of the system implementation. Specific siting is dependent upon several conditions including solar exposure and/or electrical connections available.

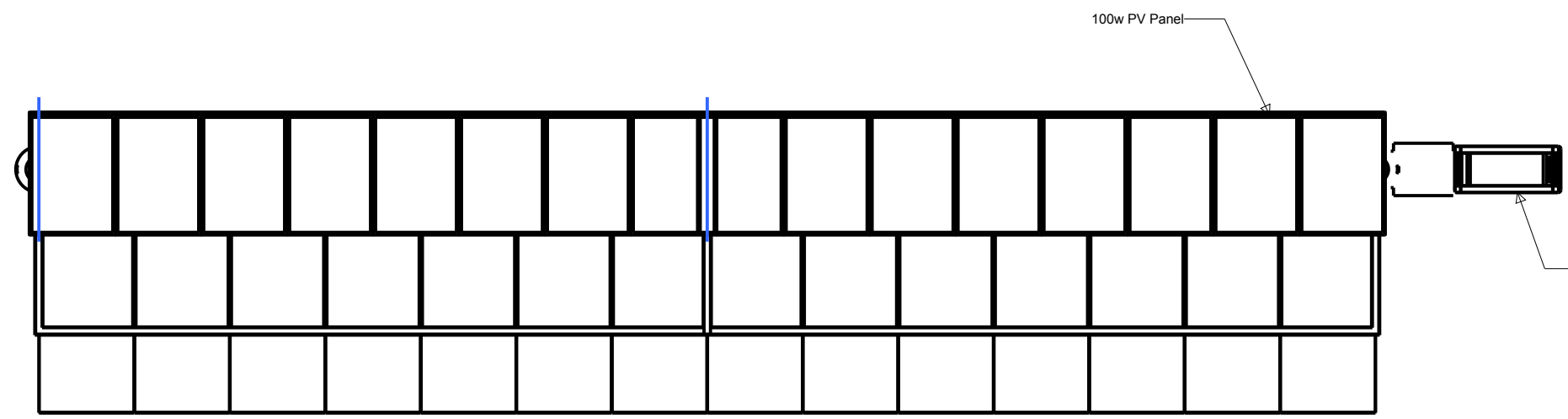


Final Proposed Site Locations - Phase I

Name	Location
City Hall	9th Street Entrance
Center Stage	6th at Grace, NW corner
VCU - MCV Parking Deck	Leigh at 10th, NE corner
Richmond Health District	Franklin and 3rd, NE corner
BioTech Park (Altria & JSRCC)	5th and Jackson, SE corner
Pleasants Park-Oregon Hill	401 S. Laurel
Downtown YMCA	Franklin, mid-block, Adams and Foushee
Abner Clay	Clay and Brook, NE corner
Broad and Belvidere Residence Ctr	Broad at Munford, NW corner
Monroe Park	Laurel at Cathedral, sidewalk or in park
Siegel Center (or residence hall)	Broad at Harrison (or Hancock)
Sydney Park	Morris at Floyd
Lombardy Shopping Center	Broad and Bowe
Randolph-Petronius Jones Park	Stuart Ave and Strawberry, SW corner
Floyd Bike Blvd	Floyd and Shields, NE corner
Whole Foods	Broad and Meadow, NW corner
Meadow Park	Park and Stuart, N side at monument
Retreat Hospital	Robinson, mid-block at entrance
VMFA	Boulevard and Hanover, TBD
Scott's Addition	Summit and Leigh, NE corner
Carytown	Cary and Belmont, SE corner
Science Museum	Broad and Davis, NW corner

Historical Rev			
Rev.	Description	Par / By	Date

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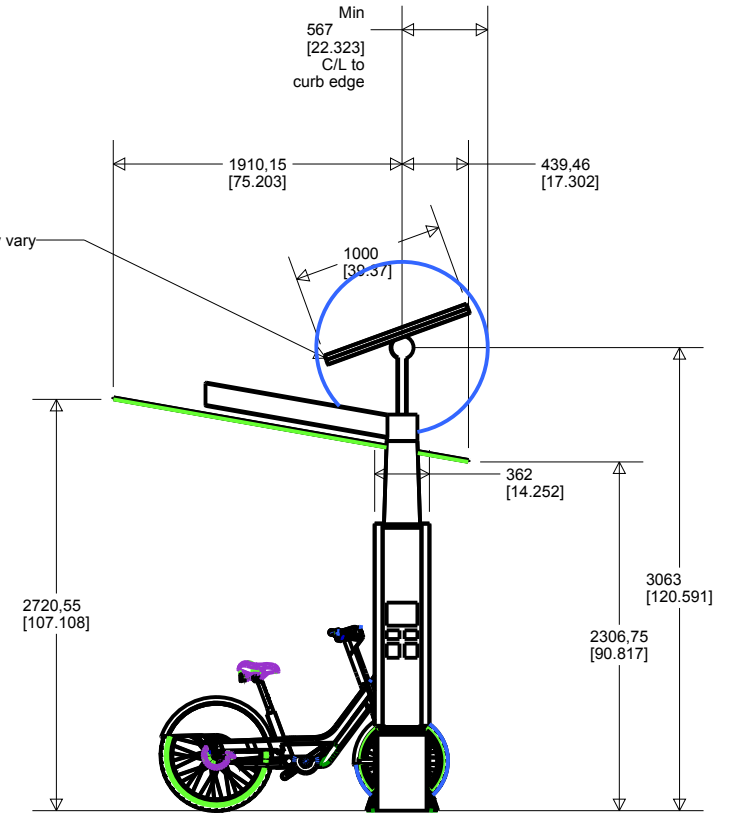
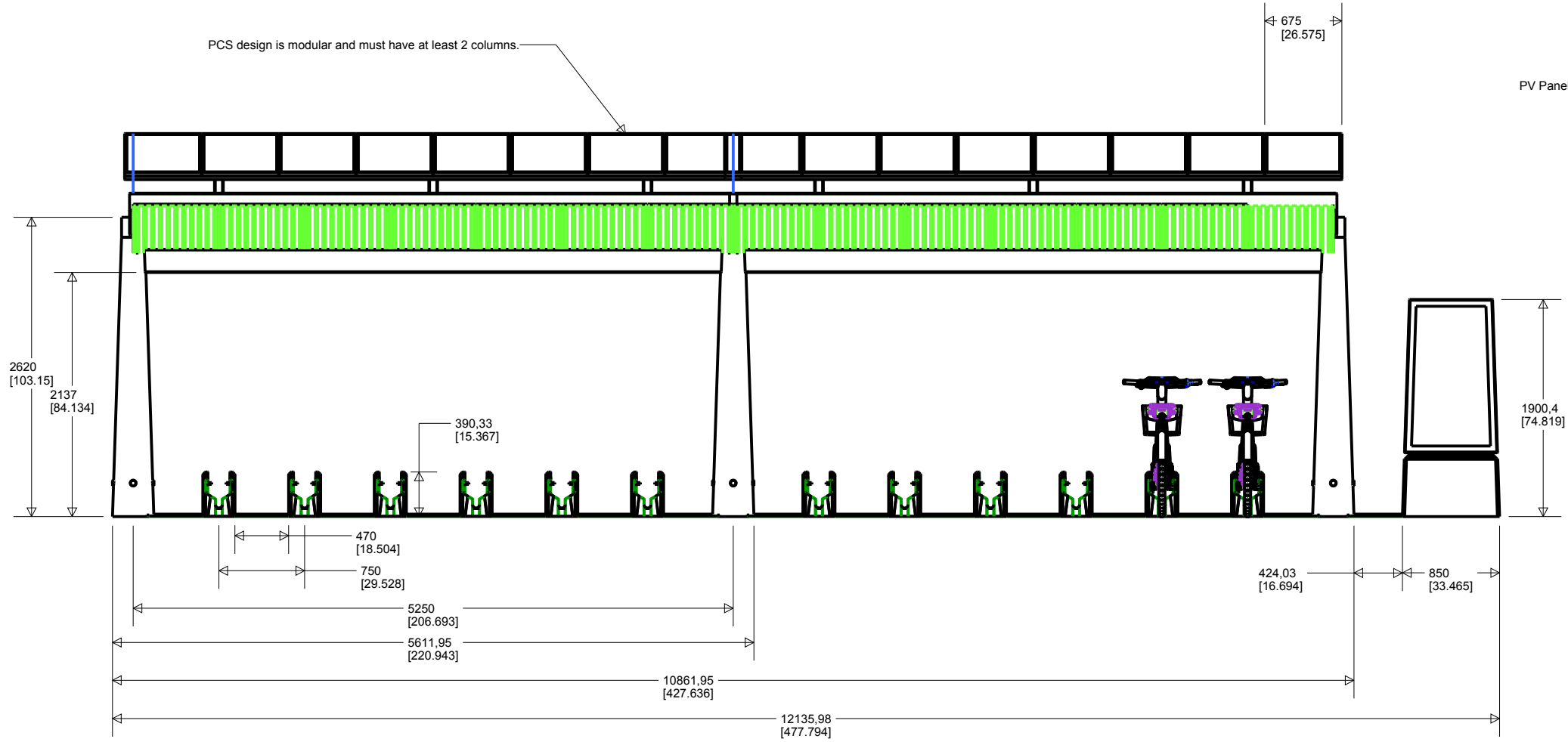


NOTE:

- For station with PCS, Concrete slab must be dimensioned by an engineer according to local regulations
- If Station is located near a bus stop, please see local regulation regarding side view mirror clearance.

Kiosk may be located on either side of the station.
Kiosk may be oriented either perpendicular or parallel to the station

PCS design is modular and must have at least 2 columns.



Technologies Bewegen inc.
Bewegen Technologies Inc.
9095 25^{ème} Avenue
Saint-Georges (Québec) Canada
G6A 1A1
1-418-228-0220
Canada - USA 1-844-228-0220

Titre: Station with PCS	
Title:	
Drw.: STATION_GENERIC_2	
Numéro pièce / Part Number: STATION_GENERIC_2	
Dessiné / Draw: D.A.	Vérifié / Check:
Échelle / Scale: 0.02	Date: 05-18-15
Format Size: B	1 ^{de} of 3

Matériel / Mat'l: N/A	Sauf Indication contraire Unless otherwise specified
Couleur / Color: N/A	Unité / Unit: mm, Kg, Sec [inch]
Fini / Finish: N/A	Angle ± 0.5°
Masse / Weight: N/A	0 decimal ± 1.0
Volume: N/A	1 decimal ± 0.5
Aire projetée / projected area: N/A	2 decimal ± 0.2

Current Rev.	Description	Par / By	Date

Motorcar Traffic flow >>>

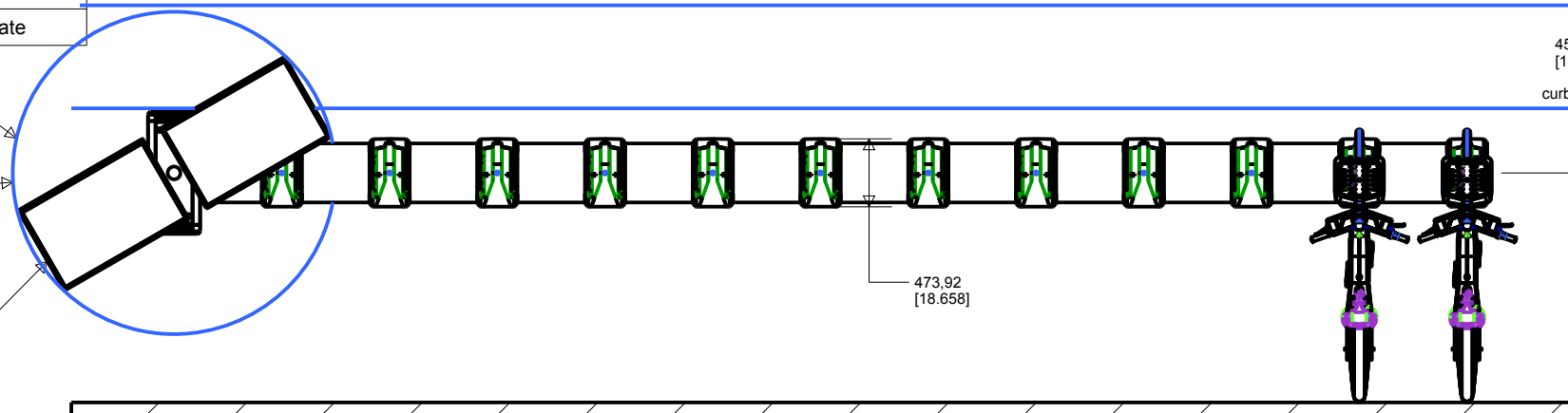
Historical Rev			
Rev.	Description	Par / By	Date

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WARNING: RISK OF ACCIDENT.
PV panel must never goes over curb edge

MAX
R1122.92
[44.209]

PV Panel must be oriented
towards the sun



MIN
450
[17.717]
C/L to
curb edge

MAX
1168
[45.984]
C/L to
curb edge

NOTE:
• For station without PCS,
Concrete slab must exceed all
element by 70mm [2-3/4"].
Concrete minimal thickness is
100mm [4"]
• If Station is located near a bus
stop, please see local regulation
regarding side view mirror clearance.

B

C

D

E

Billboard on each side of the kiosk
could be configured to be
either a way finding or advertising

kiosk
Advertising
Side

kiosk preferred location and orientation
to maximise advertising revenue

2895
[113.976]

390.36
[15.369]

280
[11.024]

679.45
[26.75]

70.55
[2.778]

kiosk
Way Finding
and
Identification side

2X 100w panel

726.57
[28.605]

253
[9.961]

1023.28
[40.287]

1900.4
[74.819]

617.76
[24.321]

691.09
[27.208]

830.99
[32.716]

G

H

362
[14.252]

429
[16.89]

470
[18.504]

750
[29.528]

8530
[335.827]

9321
[366.969]

I

J

Current Rev.	Description	Par / By	Date
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Matériel / Mat'l: N/A	Sauf Indication contraire Unless otherwise specified
Couleur / Color: N/A	Unité / Unit: mm, Kg, Sec [inch]
Fini / Finish: N/A	Angle ± 0.5°
Masse / Weight: N/A	0 decimal ± 1.0 1 decimal ± 0.5 2 decimal ± 0.2
Volume: N/A	
Aire projetée / projected area: N/A	

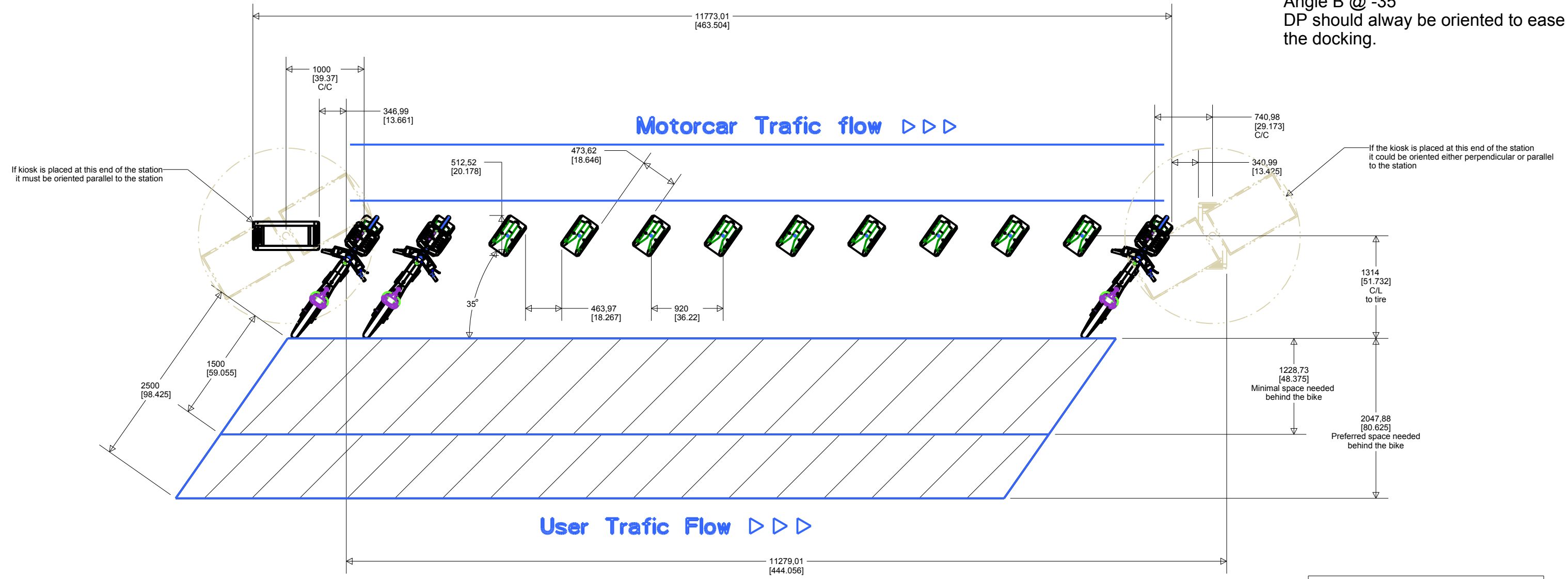
Technologies Bewegen inc.
Bewegen Technologies Inc.
9095 25^{ème} Avenue
Saint-Georges (Québec) Canada
G6A 1A1
1-418-228-0220
Canada - USA 1-844-228-0220

Titre: Station without PCS	
Title:	
Drw.: STATION_GENERIC_2	
Numéro pièce Part Number :STATION_GENERIC_2	
Dessiné / Draw: D.A.	Vérifié / Check:
Échelle / Scale: 0.02	Date: 05-18-15
Format Size B	2 ^{de} of 3

Historical Rev			
Rev.	Description	Par / By	Date

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NOTE:
2 different smart rails are available:
Angle A @ 35° (as illustrated)
&
Angle B @ -35°
DP should always be oriented to ease the docking.



Current Rev.	Description	Par / By	Date

Matériel / Mat'l: N/A	Sauf Indication contraire Unless otherwise specified
Couleur / Color: N/A	Unité / Unit: mm, Kg, Sec
Fini / Finish: N/A	Angle ± 0.5°
Masse / Weight: N/A	0 decimal ± 1.0 1 decimal ± 0.5 2 decimal ± 0.2
Volume: N/A	
Aire projetée / projected area: N/A	

Titre: Angled station without PCS	
Drw.: STATION_GENERIC_2	
Numéro pièce / Part Number: STATION_GENERIC_2	
Dessiné / Draw: D.A.	Vérifié / Check:
Échelle / Scale: 0.02	Date: 05-18-15
Format Size: B	3 de 3

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