

Columbia Containers Lighting Assessment

Prepared for:
Columbia Containers
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Vancouver, BC V5K
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1.0 INTRODUCTION

Columbia Containers has been successfully operating a grain transloading facility at 2775 Commissioner Street in Port Metro Vancouver's (PMV) South Shore Trade Area for more than 40 years. To remain competitive in the global market Columbia Containers is modernizing and rebuilding their facility.

The project, which requires a permit from PMV, has four components:

- Decommission and remove of the secondary system, stores facility and workshop and excavate new loading pits.
- Build a modern, efficient and compact transloading facility to replace the aging grain elevator at a new location slightly north (toward the water) and west of the current grain elevator, and reinstate previously removed grain storage silos.
- Move the retaining wall on the foreshore at the 'bight' approximately 20 feet to the north, accommodating PMV's realignment of Commissioner Street, part of the South Shore Corridor Project.
- Construct a new two-storey office building at the west end of the property, to replace current office trailers.

The Columbia Containers site is in areas classified as green and yellow in the East Vancouver Port Lands (EVPL) Area Plan (EVPL 2007); requiring at a minimum conditional approval with consideration of mitigation to minimise effects. The Columbia Containers site is zoned Port Terminal in the proposed Port Metro Vancouver (PMV) land use plan. Consistent with PMV's environmental approvals process for sites under its jurisdiction, and the EVPL Area Plan, Columbia Containers has conducted a lighting assessment of the proposed replacement truck shed with elevator, new railcar shed, and re-instated grain silos. The purpose of this assessment is to:

- Demonstrate that Columbia Containers respects, and has considered, the provisions and requirements of the EVPL Area Plan;
- To guide the application of lighting mitigation measures, if required; and,
- To support community information sharing and consultation processes.

2.0 METHODS

This lighting assessment is based on a comparison of the existing on-site light environment with the lighting environment for the proposed modernisation project. To compare the current and future lighting of the Columbia Containers site a number of methods were used:

- Site visit.
- Interviews with Columbia Containers managers and the engineers for the modernised plant.
- Review of The proposed Outdoor Lighting Plan compared to EVPL guidance.

2.1 SITE VISIT/PHOTO DOCUMENTATION

To assess current lighting conditions, the Columbia Containers site was observed from Wall Street and Dusty Greenwell Park on a dry evening during operational hours (active work) (October 19th 7:15pm).

Viewpoints for this assessment were chosen to represent a variety of views of the Columbia Containers facility from the Burrard View Community along Wall Street, and within Dusty Greenwell Park (**Figures 1; Table 1**):

- Viewpoint 1 2728 Wall Street
- Viewpoint 2 In Dusty Greenwell Park near Embankment edge (North of 2798 Wall Street)
- Viewpoint 3 In Dusty Greenwell Park near Embankment edge (North of 2776 Wall Street)
- Viewpoint 4 In Dusty Greenwell Park at intersection of Kaslo Street and Wall Street

Table 1 Approximate camera viewpoint elevations (m)

Viewpoint	Elevation (m)
1	~23
2	~16
3	~17
4	~21



Figure 1 Location of camera viewpoints used to assess current lighting during operations

2.2 INTERVIEWS

The current lighting conditions during both operating hours and non-operating hours were also assessed through interviews with:

- Columbia Containers Plant Manager - Current lighting conditions; and,
- Nu-Westech Engineering Ltd Kathy Fong, Project Manager - Proposed lighting conditions

2.3 NU-WESTECH OUTDOOR LIGHTING PLAN

Working with Columbia Containers, Nu-Westech Engineering Ltd has designed an Outdoor Lighting Plan for the proposed modernization. The lighting plan was designed to Canadian Standards. This includes lamps with Canadian Standards Association (CSA) or Canadian Underwriters Laboratories (CUL) certifications as well as the following standards for light fixtures:

- ANSI C136: 31 for number of cycles and acceleration.
- Safety as per CSA-C22.2 number 250, wet location 40C.
- EMI as per FCC Title & CFR Part 15, class A
- Protection from environment as per IEC 60259, degree of protection IP65 or better.

3.0 RESULTS

3.1 PHOTO DOCUMENTATION



Figure 2 Columbia Containers lighting during evening operations (active work) from viewpoint 1 (2728 Wall Street), the visible lights are from the north side of Burrard Inlet (Hemmera 2014).



Figure 3 Columbia Containers lighting during evening operations (active work) from viewpoint 2 in Dusty Greenwell Park; red circle denotes the System I west floodlight (Hemmera 2014)



Figure 4 Columbia Containers lighting during operations (active work) from viewpoint 3 in Dusty Greenwell Park; red circle denotes the System I east floodlight (Hemmera 2014)



Figure 5 Columbia Containers lighting during operations (active work) from viewpoint 4 in dusty Greenwell Park (Hemmera 2014)

3.2 INTERVIEWS AND NU-WESTECH LIGHTING PLAN

3.2.1 Current Lighting on Site

Currently, Columbia Containers operates the plant in two – 10hr shifts, seven days a week. Three flood lights remain on in active hours (turned on at 5am and off at 2am). All floodlights on the Columbia Containers site are located below the height of the embankment (approximately 14m high) between the north edge of Dusty Greenwall Park and Commissioner Street (**Table 2**). Floodlights on System I shed ends (east and west) are not visible from Wall Street viewpoints, only at lower elevations in Dusty Greenwell Park (viewpoints 2 and 3; **Figures 3** and **4**). The third floodlight, located on the workshop to the north of the System 1 facility can be seen only indirectly from Wall Street (a faint glow where it illuminates containers) (viewpoint 1 and 2; right side of **Figures 2** and **3**). The flood lights currently use a 400W Metal Halide lamp which outputs a warm white light (colour temperature 4000K, colour temperature index (CRI) >78Ra).

Operational lighting from mobile equipment includes: trains, container trucks, shuttle wagons, and container handlers. Mobile lighting was not considered further in this assessment, as very little light from these activities penetrates above the embankment between Wall and Commissioner Streets.

During the site visit, October 19 at 7:15pm, some sky glow (the broad orange glow that prevents appreciation of the night sky, EVPL 2007) from the North Shore community and lamp standards in the terminal facilities opposite Columbia Containers in Burrard Inlet (Lynnterm Terminal and Neptune Bulk Terminals Canada Ltd) was observed. Also, the existing lamp standards on Wall St provided a brighter source of light along Wall Street than the light sources observable on the Columbia Containers site.

3.2.2 Proposed Lighting on Site

After the modernization project is complete Columbia Containers will operate on similar schedule to the current one. Floodlights have been incorporated for both operations and security purposes when there is active work (~5am to 2am). The proposed lighting includes four additional floodlights over the current conditions, due to lighting for the railcar shed (2 lights; **Figure 6** upper left and **Figure 7**) and the lighting on the re-instated silos (3 lights; **Figure 6** and **Figure 7**). One current floodlight, on the to-be-workshop near the existing System II facility, will be removed. In addition, three – motion sensor lights will also be included; between the larger malt silos and pea silos. All new floodlighting, and motion sensor lighting, like that for the current lighting, will be placed below the embankment height (**Table 2**). The proposed floodlights will incorporate 80W LED lamps (or equivalent) which output a warm white light (colour temperature 4000K, CRI >78Ra).

Table 2 Existing and proposed floodlight locations, type, heights, and numbers for Columbia Containers sheds, elevator, and silos

Structure	Existing			Future		
	Type	Number	Height	Type	Number	Height
System I: Rail Car Shed, Truck Shed, and Elevator*	400W Metal halide	2	6.4m	80w LED	2	7.2m
				80w LED	2	7.2m
	None	None	None	None	None	None
System II structure	400W Metal halide	1	4m	None	None	None
Silos 330 malt	None (currently using shipping containers with no floodlights)			80w LED	2	9.75m
Silos 1200 and 1400 MT malt				None	None	None
Silos 2900 MT pea				80w LED	1	6.0m

Notes: * Elevator Tower extends from Truck Shed Building in both existing and future infrastructure

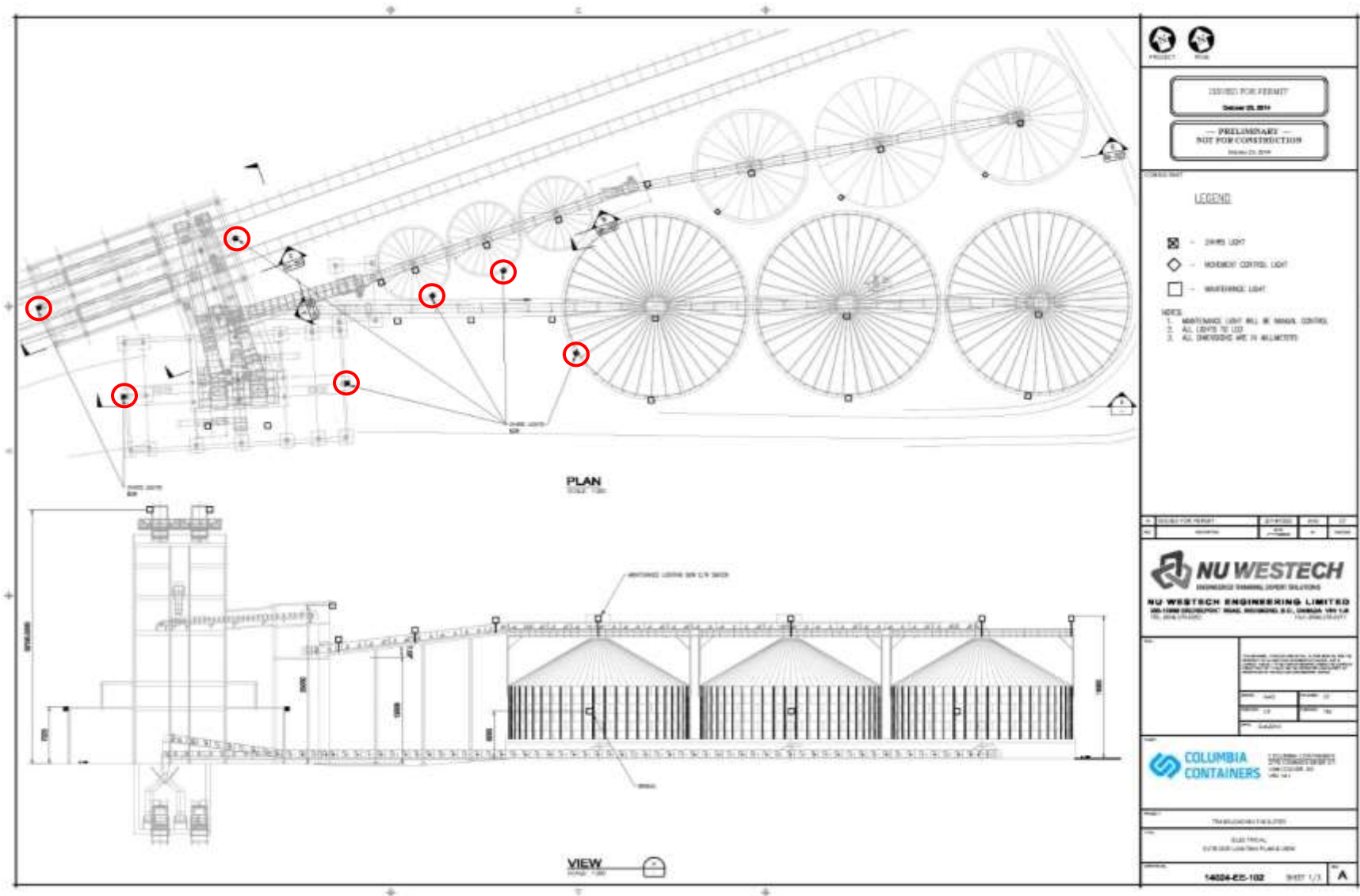


Figure 6 Columbia Containers Outdoor Lighting Plan: view 1, floodlights circled in red (Nu-Westech Engineering Ltd 2014)

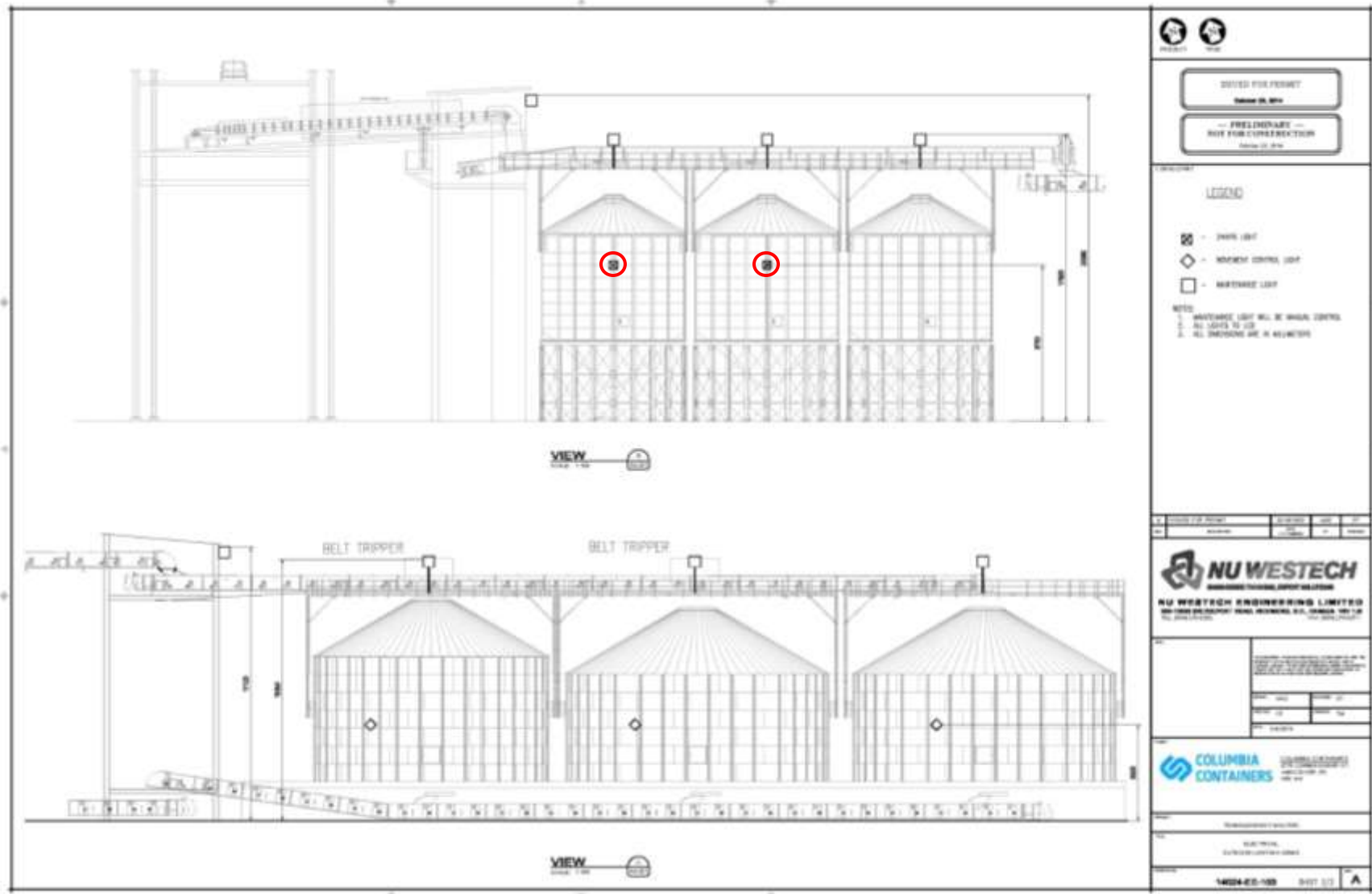


Figure 7 Columbia Containers Outdoor Lighting Plan: view 2, floodlights circled in red (Nu-Westech Engineering Ltd 2014)

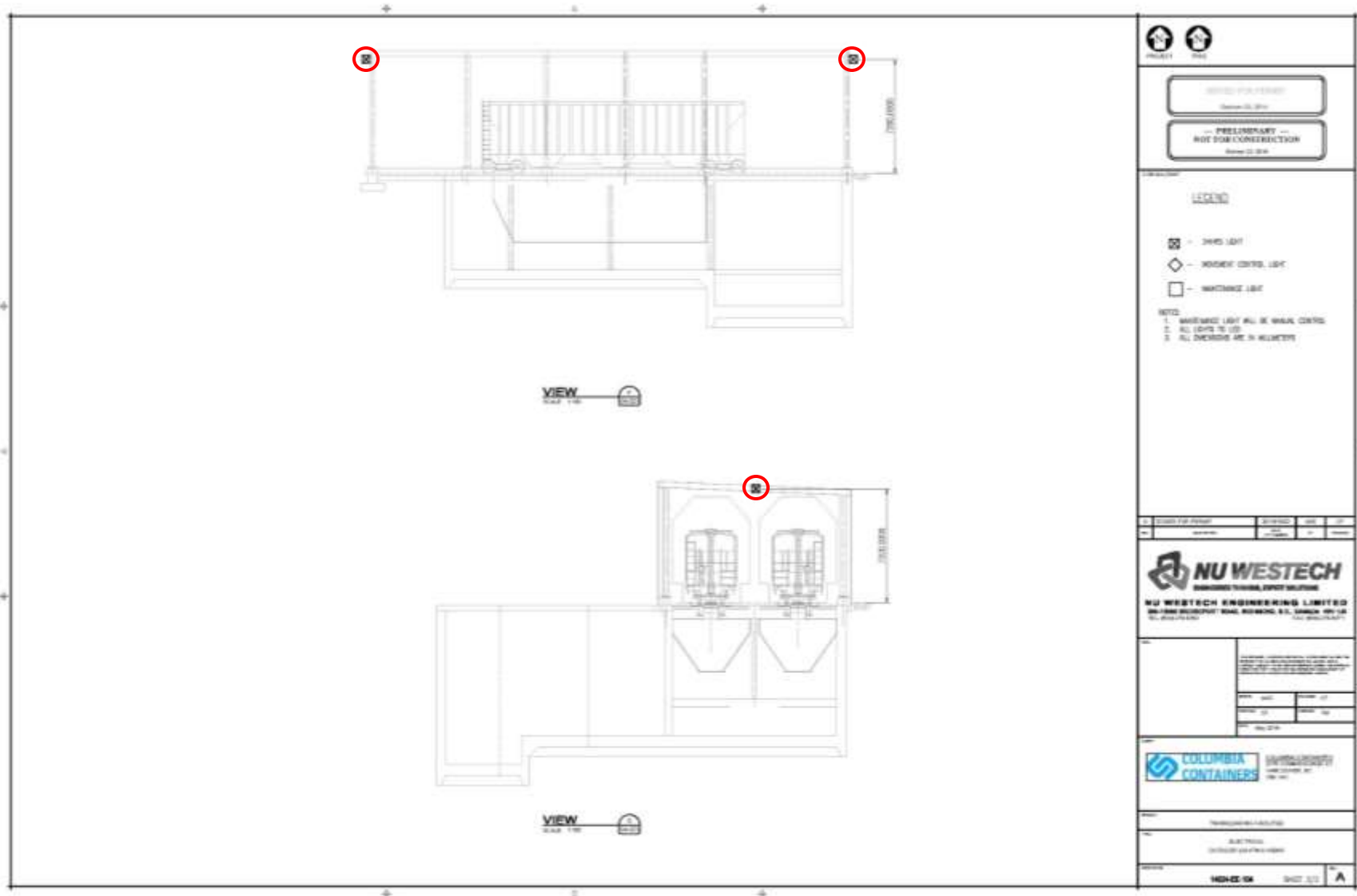


Figure 8 Columbia Containers Outdoor Lighting Plan: view 3, floodlights circled in red (Nu-Westech Engineering Ltd 2014)

4.0 DISCUSSION

4.1 CONSISTENCY WITH THE EVPL AREA PLAN

In response to community concerns, and to give more certainty around land use decisions the Burrardview Community Association, the Vancouver Port Authority (VPA), and the City of Vancouver produced guidance for land use planning in the area of East Vancouver Port Lands. The EVPL Area Plan aims to “balance the business interests and of the Port and the livability needs of the adjacent community” through “mutually established planning criteria, and mitigation techniques... to minimize the individual and cumulative impacts of Port activities on the adjacent residential community” (EVPL 2007).

Under the EVPL Area Plan (2007), “lighting that is properly designed and managed should have little impact on the adjacent residential community”. The EVPL Area Plan includes two guiding principles that recognize that:

1. Lighting is required in Port areas to provide for safe operations and fulfill security obligations; and,
2. Excessive or poorly designed lighting can negatively impact adjacent residents

The Columbia Containers modernization project seeks to replace and rebuild existing or previously removed structures. The truck shed / elevator, railcar shed and silos that are being replaced are all either present on the site currently, or in the case of the silos were temporarily substituted with stacked container storage for the past eight years. The proposed alterations to the Columbia Containers site are consistent with current and historical land uses, and with zoning for the land. Lighting for the proposed infrastructure has been designed to minimize the number of floodlights, while ensuring operations can continue safely while maintaining security standards (**Table 2, Figures 6 – 8**).

Two policies from section 4.2.2 Lighting Policies in the EVPL Area Plan (EVPL 2007) are relevant to this lighting assessment. For each, a discussion of how it is addressed in the design and site layout is provided.

L1: Applications for new development within the EVPL will include a lighting plan that ensures new light fixtures provide no more than the minimum lighting needed for the intended purpose, considering nationally recognized standards.

The lighting plan for the Columbia Containers modernization has been designed to minimize the number of light structures required for operations while maintaining a safely-lit operations area as per national standards. As such, seven floodlights will be installed, and will serve for both operations and security. Due to the implementation of a second building (the railcar shed), two additional flood lights will be required (over and above the existing System I: railcar/truck shed building flood lights) at either end of the rail car building (**Table 2, red circles in Figure 8**). Silos that were removed from the site in 2008 did not include floodlights; however, the re-instated silos

will have three floodlights. An additional three motion sensor floodlights will be installed between the pea and malt silos; these will turn on only when triggered by nearby activity. The proposed lighting for the site incorporates 80W LED flood lights (or equivalent). These lights are similar in to the current 400W metal halide lights, and will output a warm light (colour temperature 4000K, CRI >78Ra).

L2: Ensure that the lighting level is the minimum required to ensure safety and security and that it points north or is shielded as much as possible to reduce impacts on residential properties located to the south.

The proposed outdoor lighting plan incorporates 7 – flood lights on site (**Table 2**, red circles in **Figure 6 – 8**). As with the current flood lights on site, these will all be placed at heights (6.0 - 9.75m) that are below the embankment (approximately 14m high) between Wall St (at the North border of Dusty Greenwall Park) and Commissioner Street. Since there is no light trespass (intrusion of light into homes) or glare (unshielded bright lighting) from the current lighting conditions, the proposed flood lights are not anticipated to cause either of these types of light pollution along Wall Street. To mitigate light pollution above the embankment, floodlights will be directed towards the ground and, if deemed necessary during installation, floodlights will be installed with a shield. Proposed maintenance lighting is placed around site on various structures but will only be turned on when necessary for maintenance or repairs and, is not anticipated for use during regular operations (**Figures 6 - 8**). In some locations where floodlights are not required, but where lighting is sometimes necessary, motion-triggered lighting will be used to minimise light pollution (and energy use).

5.0 CONCLUSION

Although the number of operational flood lights will increase in the proposed modernization of Columbia Containers, the lighting is not likely to have an increased impact on the adjacent Wall Street residential community, due to mitigation measures included as part of the design.

1. The minimum amount of floodlights necessary for safe and secure operations have been specified
2. All lighting will be below the height of the embankment, as is the case currently
3. Motion-sensors are included for floodlights not required for safety and security
4. Shielding to aim lights to the north will be installed if necessary to avoid light trespass in nearby communities.

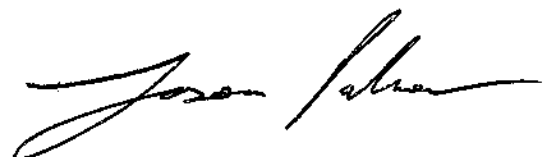
The lighting plan respects the provisions of the EVPL area plan, and includes the minimum lighting necessary for safe and secure operations of the Columbia Containers site.

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6.0 STATEMENT OF LIMITATIONS

This report was prepared by Hemmera Envirochem Inc. (“Hemmera”), based on fieldwork conducted by Hemmera, for the sole benefit and exclusive use of Columbia Containers Ltd. The material in it reflects Hemmera’s best judgment in light of the information available to it at the time of preparing this Report. Any use that a third party makes of this Report, or any reliance on or decision made based on it, is the responsibility of such third parties. Hemmera accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this Report.

Hemmera has performed the work as described above and made the findings and conclusions set out in this Report in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession practicing under similar conditions at the time the work was performed.

This Report represents a reasonable review of the information available to Hemmera within the established Scope, work schedule and budgetary constraints. The conclusions and recommendations contained in this Report are based upon applicable legislation existing at the time the Report was drafted. Any changes in the legislation may alter the conclusions and/or recommendations contained in the Report. Regulatory implications discussed in this Report were based on the applicable legislation existing at the time this Report was written.

In preparing this Report, Hemmera has relied in good faith on information provided by others as noted in this Report, and has assumed that the information provided by those individuals is both factual and accurate. Hemmera accepts no responsibility for any deficiency, misstatement or inaccuracy in this Report resulting from the information provided by those individuals.

The liability of Hemmera to Columbia Containers Ltd. shall be limited to injury or loss caused by the negligent acts of Hemmera. The total aggregate liability of Hemmera related to this agreement shall not exceed the lesser of the actual damages incurred, or the total fee of Hemmera for services rendered on this project.