Appendix A

Archaeological Report

SOURCES ARCHAEOLOGICAL AND HERITAGE RESEARCH INC.
303-343 Railway Street, Vancouver, BC Canada V6A 1A4
T 604 251 3002 F 604 251 3001 sourcesarch.com

22 June, 2019

Randy Burgin
Canadian Coast Guard – Fisheries and Oceans Canada
Project Manager
Victoria, BC

Re: HCA 2019-0132 – Summary Letter Report: AIA Surveys of Fisheries and Oceans Canada (DFO) PID 008-170-762 (Lot 22, Section 31, Township 6, Rupert District, Plan 45348),PID 008-179-771 (Lot 23, Section 31, Township 6, Rupert District, Plan 45348), PID 016-857-674 (Lot 1, District Lot 2263, Rupert District, Plan VIP51510 (the "Water Lot"), Water Lot Lease No. 104843), at Jensen Cove Road, Port Hardy, B.C.

Dear Randy Burgin,

Please find below a summary of results and findings of the archaeological impact assessments of Lots 1, 22, and 23 at Jensen Cove Road, Port Hardy, B.C., conducted by *Sources Archaeological and Heritage Research Inc.* Further details concerning this Archaeological Impact Assessment will be provided in the forthcoming final permit report that will include figures, impact assessment, and cultural resource management recommendaions.

1.0 Results

On June 19-20, *Sources Archaeological and Heritage Research Inc*. (*Sources*) conducted an Archaeological Impact Assessment (AIA) survey that consisted of a pedestrian and subsurface survey of Lots 1, 22, and 23, at Jensen Cove Road (Plate 2). Seven (7) auger tests, three (3) shovel tests, and two (2) machine excavated tests were conducted mainly on Lots 1 and 22, and all tests were met with negative results for archaeological remains. These tests included several inspected and recorded natural soil exposures that were also met with negative results for archaeological remains.

The survey included a visual inspection of landforms outside and to the west of Lot 22 along the immediate shoreline (ATs # 1-2) up to a distance of 60 m from the identified western property boundary. Tests (ATs # 3-7, STs # 1-2, MTs # 1-2) conducted within and at the SE corner of Lot 22 encountered historical land fill materials and remains possibly related to the early establishment of Port Hardy and an alleged historical general store, and associated trail and wharf that was situated near the shore of the adjacent Lot 24. Sub-surface deposits consisted of existing or non-existing shallow organic layers, followed by industrial fill comprised of a grey-brown to red-orange brown sandy silt with approximately 10-30% gravels with historic debris inclusions (glass, ceramic, metal, etc.), followed by a sterile grey-blue-yellow marine sediment, and rock and/or bedrock.

It was evident during the survey, that the entire footprint has been previously disturbed by a long history of previous developmental impacts and disturbances, including blasting, leveling and landfilling. **No archaeological or post-1846 traditional use sites or features were found.**

This AIA was conducted with a B.C. Heritage Conservation Act (HCA) Permit 2019-0132, awarded to Hartley Odwak of Sources. The fieldwork was conducted with the full support and fieldwork participation of the Kwakiutl First Nation, whose territory the study area is located within. *Sources* archaeologist Kennedy Richard with Kwakiutl field assistant Charles Wilson conducted the survey concerned with this proposed development.

2.0 Recommendations

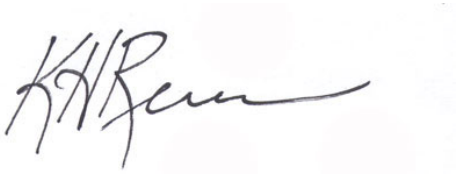
Based on the negative results of the archaeological field assessment of this development, further archaeological work is considered to be highly unlikely. However, the following recommendations are made should any further excavation be required at this location:

- Canadian Coast Guard – Fisheries and Oceans Canada informs all contractors and operators who will be involved with development activities in these Lots 1, 22, and 23 and ancillary developments that archaeological remains in the Province of British Columbia are protected from disturbance, intentional or inadvertent, by the ***B.C. Heritage Conservation Act*** (RSBC 1996, Chapter 187), the ***Forestry Planning and Practices Regulations*** (29 February, 2016), and the ***Vancouver Island Land Use Plan*** (December 2000); and

- Canadian Coast Guard – Fisheries and Oceans Canada informs contractors that, in the event that previously unidentified archaeological remains are encountered, activities that could endanger the archaeological remains must be suspended at once. The B.C. Archaeology Branch, and the Kwakiutl First Nation (Fort Rupert IR #1) must be informed, as soon as possible, of the location and type of the archaeological remains and the nature of the disturbance.

These recommendations apply solely to physical archaeological evidence of past human activity and in no way attempt to encompass any traditional land use or heritage concerns of the Kwakiutl First Nation.

Sincerely,



Kennedy Richard, B.A.
Senior Field Director (COAST/INTERIOR)

Appendix B

Geotechnical Report - Land

Lewkowich Engineering Associates Ltd.
geotechnical • health, safety & environmental • materials testing

Department of Fisheries and Oceans
4260 Inglis Drive
P.O.Box 3
Richmond, BC
V7B 1L7

File Number: F6903.02
Date: Sept 3, 2019

Attention: Mr. Don Storry

PROJECT: PROPOSED DFO/COAST GUARD SITE DEVELOPMENT 6264 JENSEN COVE ROAD (LOT 21), PORT HARDY, BC

SUBJECT: GEOTECHNICAL ASSESSMENT - LANDSIDE

Dear Mr. Storry:

1. INTRODUCTION

As requested, Lewkowich Engineering Associates Ltd. (LEA) has carried out a geotechnical assessment of the above referenced property with respect to the proposed DFO/Coast Guard site development project (Oceans Protection Plan Depot). This report provides a summary of our findings and recommendations.

2. BACKGROUND

LEA understands the proposed development consists of a two storey industrial building with associated parking areas and civil works. We understand that the proposed building structure will be of conventional construction methods consisting of wood, steel and/ or concrete superstructures supported by a conventional cast-in-place concrete foundation system.

3. ASSESSMENT OBJECTIVES

Our assessment, as summarized within this report, is intended to meet the following objectives:

i. Determine if the land is considered geotechnically safe and suitable for the use intended (defined for the purposes of this report as the construction of a two storey industrial building), with the probability of a geotechnical failure resulting in property damage of less than;

- 2% in 50 years for geotechnical hazards due to seismic events, including slope stability, and,
- 10% in 50 years for all other geotechnical hazards, with exception of a flooding hazard which is based on a 1 in 200 year storm event.

ii. Identify any geotechnical deficiencies that might impact the design and construction of the development and prescribe the geotechnical works and any changes in the standards of the design and construction of the development that are required to ensure the land, buildings, and works and services are developed and maintained safely for the use intended.

iii. Acknowledge that approving and/or building inspection officers (or equivalent) of the District of Port Hardy may rely on this report when making a decision on applications for the development of the land.

4. ASSESSMENT METHODOLOGY

a. The subsurface geotechnical investigation was carried out on June 25, 2019 using a Caterpillar 330L excavator provided by North Island Rockpro Inc. A total of seven (7) test pits (TP 19-01 and TP 19-07) were advanced at accessible locations throughout the proposed development property. All test pits were backfilled upon completion.

b. A site plan showing the location of the test pits (Drawing F6903-01) is attached, following the text of this report.

5. SITE CONDITIONS

5.1. General

a. The subject property is located in Port Hardy, BC, on the north side of Jensen Cove Road. The property is bounded by an undeveloped industrial property to the west, a developed industrial property to the east, and Jensen Cove/ Hardy Bay to the north.

b. We understand the site was formerly utilized as a processing area to load mineral aggregate (Geyserite) onto barges; as such, the site has been extensively manipulated (blasted and graded) to accommodate the operation.

c. Remaining site infrastructure includes a two storey building in proximity to the northwest extent of the property as well as a partially deconstructed pier.

d. With the exception of the steep embankment along the frontage and access roadway along the eastern extent, the site is relatively flat with a slight declination towards the north as a result of the previous mining operations. The embankment is approximately 8m in height with an inclination of approximately 1 to 2 (horizontal / vertical).

5.2. Soil Conditions

a. Consistent soil strata were encountered during the test pitting investigation and comprised of the following:

   i. a layer of dense, well-graded geyserite rock rubble in the majority of the test pits; underlain by,

   ii. a layer of dense, well-graded basalt rock rubble in the majority of the test pits; underlain by,

   iii. a layer of very dense sand/ silty sand, with trace percentages of gravel in two (2) of the test pits; underlain by,

   iv. weathered and/or homogenous bedrock in all of the test pits.

b. Detailed descriptions of the subsurface conditions are provided on the appended test pit logs (TP19-01 to TP18-07). Bedrock is described as plagioclase-phyric basalt of the Karmutsen formation (Vancouver Group).

c. Soil classification terminology is based on the Modified Unified classification system. The relative proportions of the major and minor soil constituents are indicated by the use of appropriate Group Names as provided in ASTM D2488-93 and D2487 Figures 1a, 1b, and 2. Other descriptive terms generally follow conventions of the Canadian Foundation Engineering Manual.

5.3. Flooding Hazard

a. In the event of a design flood, based on the current elevation of the site, it is possible that floodwaters from the ocean would inundate the property. The general risk of flooding and the degree or severity of the floodwater increases as the sea level rises.

b. A design storm event or severe wave action will not likely change the shoreline fronting the property as it is made up of basaltic bedrock which is highly resistant to ocean erosive forces.

5.4. Groundwater

a. Minor groundwater seepage was observed approximately two (2) of the test holes during the investigation at depths ranging from 0.9m to 2.2m below the existing grade. We expect groundwater to flow over impermeable deposits (glacial till) and bedrock, in a northerly direction (toward the ocean).

b. Groundwater levels can be expected to fluctuate seasonally with cycles of precipitation. Groundwater conditions at other times and locations can differ from those observed within the test pits at the time of our assessment.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. General

Determine if the land is considered geotechnically safe and suitable for the use intended (defined for the purposes of this report as the construction of a two storey industrial building), with the probability of a geotechnical failure resulting in property damage of less

than;

- 2% in 50 years for geotechnical hazards due to seismic events, including slope stability, and,
- 10% in 50 years for all other geotechnical hazards, with exception of a flooding hazard which is based on a 1 in 200 year storm event.

Provided the recommendations in this report are followed.

6.2. Seismic Issues

a. No liquefiable soils were encountered during the test pitting investigation.

b. Based on the 2018 British Columbia Building Code, Division B, Part 4, Table 4.1.8.4.A, "Site Classification for Seismic Site Response," the bearing soils and strata encountered during the test pitting investigation would be "Site Class C" (Very Dense Soil and/or Soft Rock).

6.3. Flood Construction Level (FCL)

a. In the past, in areas without published Floodplain Mapping, the convention has been to establish the minimum Flood Construction Level (FCL) as 1.5m above the Natural Boundary (NB). However, to account for future sea level rise, coastal communities are adopting new methods for determining FCL.

b. The Kerr Wood Leidal Associates Ltd. (KWL) report provides the methodology for the "combined method" to determine an adequate FCL that incorporates the issue of sea level rise and other mitigating factors.[1] This method is the recommended practice by Engineers and Geoscientists of British Columbia (EGBC). The methodology includes the following variables, known to have implications for potential flooding in coastal regions:

i. Higher High-Water Large Tide (HHWLT)
ii. Sea Level Rise (SLR)
iii. Crustal Rebound (CR)

iv. Storm Surge (SS)
v. Wave Effect (WE)
vi. Freeboard (FB)

$$FCL = HHWLT + SLR + CR + SS + WE + FB$$

c. Using the above equation, and based on a projected 100-year lifespan for the assumed development, the minimum FCL derived using the combined method is shown in Table 1 below.

Table 1: FCL determination using the "combined method" as recommended by EGBC.

HHWLT (m)	SLR (m)	CR (m)	SS (m)	WE (m)	FB (m)	FCL (m)
2.7	1.0	-0.2	1.3	0.65	0.60	6.05

Elevation information from the Port Hardy monitoring station (#8408) was used for these calculations.

Based on the above calculations, we recommend that an **FCL of 6.05m geodetic** (concrete slab-on-grade elevation or underside of floor joists) is used for any future development relating to habitable dwellings or residential construction.

6.4. Floodwater Discussion & Recommendations

a. Provided any construction within the property satisfies the minimum recommended FCL, we do not anticipate any damage to structures as a result of floodwater. However, any areas constructed below the recommended FCL could be subject to flooding during less than design flood events.

b. If fill material is required to raise the ground surface in order to meet the FCL level in whole or part, the fill material should consist of a coarse fractured rock as directed by the Geotechnical Engineer. The on-site rock rubble material would meet this requirement.

c. It is recommended that backflow preventers be installed in all sewer and drainage piping that exits below the recommend FCL level.

6.5. Floodwater Discussion (Tsunami)

a. The Kerr Wood Leidel Report (reference 2) indicates that for planning purposes (i.e. Evacuation Planning) the Tsunami levels for the subject site (Strait of Georgia) Zone E should be 2.0m above normal highest tide. We understand that City of Port Hardy has a plan in place that is linked to the Tsunami Warning system for the Pacific Coast. Currently our recommend FCL height is greater than the predicted Tsunami Level.

b. A review of the data available for the tsunami of March 27-29, 1964, on the west coast of Canada indicates there is no record of tsunami action for this event in Port Hardy. At Alert Bay, located 40 kilometers east of Hardy Bay, the 1964 tsunami had a level of 1.1m below HHWLT (reference 3).

6.6. Permanent Dewatering

Conventional requirements of the 2018 British Columbia Building Code pertaining to building drainage are considered suitable at this site. Once final plans and tentative elevations are determined, the Geotechnical Engineer should be consulted to provide further dewatering data.

6.7. Pavement Design – On Site Roadways & Parking Areas

a. Any organic or deleterious material should be removed from beneath designated roadway, driveway, or parking areas prior to subgrade preparation. If fill is required to bring the subgrade up to a desired elevation, structural fill should be used.

b. The subgrade encountered throughout the majority of the site consisted of a mantle of rock rubble material overlying the *insitu* bedrock/ glacial till soils; which is considered suitable for supporting gravel driveways/ paring areas. The subgrade should be proof rolled after final compaction and any areas showing visible deflections should be inspected and repaired.

c. We recommend the following for pavement structures within the site should asphalt be considered:

Asphaltic Concrete Pavement	= 50 mm
Granular Base Course (19mm crush)	= 100 mm
Standard Subbase Preparation (SGSB)	= 250 mm

d. It is recommended that a reinforced concrete slab be utilized where garbage dumpsters are located. The slab should be large enough to contain the disposal unit and front tires of the garbage truck during disposal operations.

6.8. General Excavation Recommendations

a. Prior to construction, all unsuitable materials should be removed to provide a suitable base of support. Unsuitable materials include any non-mineral material such as vegetation, topsoil, peat, fill or other materials containing organic matter, as well as any soft, loose, or disturbed soils.

b. We anticipate the depth of stripping for building foundations will vary from approximately 0.5m to 2.5m below existing grade. Suitable bearing depths are noted in the attached test pit logs.

c. Fine grained soils (glacial till) are particularly moisture sensitive. Exposure to wet conditions can make these soils unsuitable for load bearing. Exposed fine-grained soils should be adequately protected from seepage and wet weather conditions

d. Conventions outlined in the Occupational Health and Safety Regulations under Part 20, Sections 20.78 through 20.95 should be adhered to for any excavations on site. Where excavations scenarios are not clearly defined under these regulations, a qualified geotechnical engineer should be consulted to assess potential hazards and provide recommendations.

e. The Geotechnical Engineer should be consulted immediately with any slope stability concerns during construction. Excavation side walls higher than 1.2m should be sloped at 1H:1V or terraced with vertical heights of each terrace not exceeding 1.2m, unless otherwise

approved by the Geotechnical Engineer. Individual terraces should be at least as wide as they are high. The Geotechnical Engineer should be consulted where vertical heights for the excavation side walls exceed 1.2m.

f. Ground water ingressing into any excavations should be controlled with a perimeter ditch located just outside of the building areas, connected to positive drainage.

g. The Geotechnical Engineer is to confirm the removal of unsuitable materials and approve the exposed, competent, inorganic subgrade.

6.9. Structural Fill

a. Structural fill should be used where fill is required to raise areas that will support buildings, slabs, or pavements. The Geotechnical Engineer should first approve the exposed subgrade in fill areas, to confirm the removal of all unsuitable materials. The thickness of structural fill should be consistent in all areas below the footing elevation to minimize differential settlements (where possible).

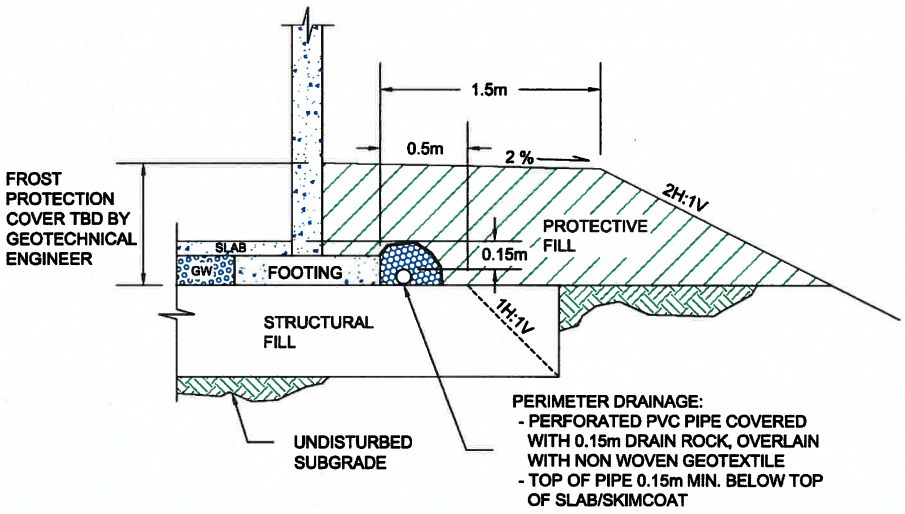
b. Structural fill should be inorganic sand and gravel. If structural fill placement is to be carried out in the wet season, material with a fines content limited to 5% passing the 75μm sieve should be used, as such a material will not be overly sensitive to moisture, allowing compaction during rainy periods of weather.

c. The on-site fill materials are considered suitable for bulk structural fill, they consist of grey-brown rock rubble materials and grey sands and gravels. Any pieces greater than 300mm should be removed. Imported sand and gravels should be utilized for under slab foundation infill, service line trenching and for pavement structure per specifications.

d. The structural fill zone within the foreshore area should be protected with a suitable foreshore armouring program (Design by SNC Lavalin) typically consisting of large boulders, filter rock and geotextile barrier.

e. Structural fill should be compacted to a minimum of 95% of the corresponding Modified Proctor maximum dry density (ASTM D1557) in foundation and floor slab areas, as well as in paved roadway and parking areas.

f. Structural fills under foundations should include the zone defined by a plane extending down and outward a minimum 0.5m from the outer edge of the foundation at an angle of 45 degrees from horizontal to ensure adequate subjacent support. See figure below



g. Compaction of fill should include moisture conditioning as needed to bring the soils to the optimum moisture content and compacted using vibratory compaction equipment in lift thickness appropriate for the size and type of compaction equipment used.

h. A general guideline for maximum lift thickness is no more than 100mm for light hand equipment such as a "jumping-jack," 150mm for a small roller and 300mm for a large roller or heavy (>500 kg) vibratory plate compactor or a backhoe mounted hoe-pac or a large excavator mounted hoe-pac, as measured loose.

i. It should be emphasized that the long-term performance of buildings, slabs, and pavements is highly dependant on the correct placement and compaction of underlying structural fills.

Consequently, we recommend that structural fills be observed and approved by the Geotechnical Engineer. This would include approval of the proposed fill materials and a suitable program of compaction testing during construction.

6.10. Foundation Design & Construction

a. Based on the current design the foundations will likely bear on structural fill which will have a bearing capacity of a Service Limit State (SLS) bearing capacity of 150 kPa and an Ultimate Limit State (ULS) bearing capacity of 200 kPa. These values assume a minimum 0.6m depth of confinement or cover.

b. Provided the recommendations in this report are followed, we expect that total building settlement will not exceed 25mm, with total differential movement not exceeding 15mm between column spacing.

c. Exterior footings should be provided with a minimum 0.6m depth of ground cover for frost protection purposes.

d. Although the subgrade bedrock is competent, minor reflection cracking may occur where the subgrade transitions from bearing type to another. We recommend placing and compacting a 0.3m (minimum) thick layer of structural fill over the bedrock areas (if any) over foundation footprint areas to reduce the potential for reflection cracking.

e. Prior to placement of concrete footings, any bearing soils that have been softened, loosened, or otherwise disturbed during the course of construction should be removed, or else compacted as per our recommendations for structural fill. Compaction will only be feasible if the soil has suitable moisture content and if there is access to heavy compaction equipment. If no structural fill is placed, a smooth-bladed clean up bucket should be used to finish the excavation.

6.11. Embankment Stabilization

a. As discussed, an eight (8) meter tall steep slope exists along the site frontage; consisting of a four (4) meter high stacked rock retaining wall throughout the bottom half where it transitions into a steep slope throughout the top half. The current configuration of the embankment (1H to 2V) is not considered stable during a seismic event.

b. It is the opinion of LEA that the most cost effective and feasible option to stabilize the embankment would be to reduce the inclination utilizing a segmental block retaining wall to stabilize and define the toe of the slope. See details provided on the attached LEA Drawing No. F6903-02 Dated September 3, 2019.

7. GEOTECHNICAL ASSURANCE AND QUALITY ASSURANCE

At the discretion of the governing authority, a geotechnical engineer may be retained to provide Geotechnical Assurance services for the construction of buildings. Geotechnical Assurance services include review of the geotechnical components of the plans and supporting documents, and responsibility for field reviews of these components during construction.

8. ACKNOWLEDGEMENTS

Lewkowich Engineering Associates Ltd. acknowledges that this report may be requested by the building inspector (or equivalent) of the District of Port Hardy as a precondition to the issuance of a building permit. It is acknowledged that the Approving Officers and Building Officials may rely on this report when making a decision on application for development of the land. We acknowledge that this report has been prepared for, and at the expense of CCG Management Services, contract no. F1802-180075.

9. LIMITATIONS

The conclusions and recommendations submitted in this report are based upon the data obtained from a limited number of widely spaced subsurface explorations. The nature and

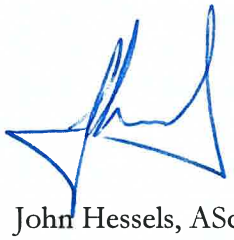
extent of variations between these explorations may not become evident until construction or further investigation. The recommendations given are based on the subsurface soil conditions encountered during the test pitting and drilling programs, current construction techniques, and generally accepted engineering practices. No other warrantee, expressed or implied, is made. Subgrade conditions are known only at the test pit locations and have been used to infer conditions throughout the site in preparation of this report. If unanticipated conditions become known during construction or other information pertinent to the development become available, the recommendations may be altered or modified in writing by the undersigned.

10. CLOSURE

Lewkowich Engineering Associates Ltd. appreciates the opportunity to be of service on this project. If you have any comments, or additional requirements at this time, please contact us at your convenience.

Respectfully Submitted,

Lewkowich Engineering Associates Ltd.



John Hessels, AScT
Senior Technologist

Chris Hudec, M.A.Sc., P.Eng.
Senior Project Engineer

ATTACHMENTS:

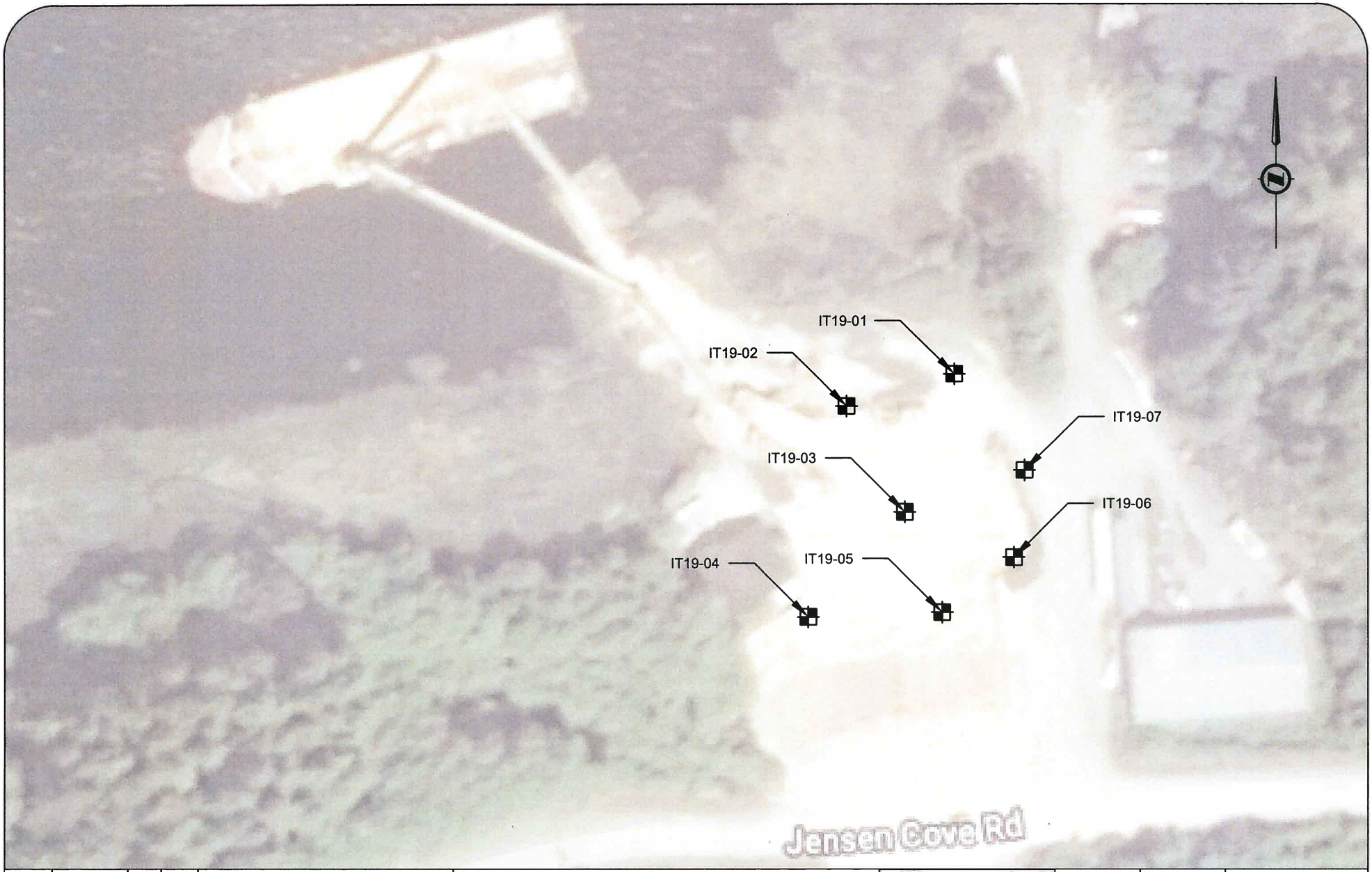
1. LEA Drawing No. F6903-01 – Test Pit Site Plan
2. LEA Drawing No. F6903-02 – Bank Stabilization Detail
3. LEA Test Pit Logs TP19-01 to TP19-07

REFERENCES:

1. Engineers and Geoscientists of British Columbia report titled "Professional Practice Guidelines – Legislated Flood Assessments in a Changing Climate in BC," version 2.1, Dated August 28, 2018.

2. Kerr Wood Leidal Associates Ltd. report titled "*Coastal Floodplain Mapping – Guidelines and Specifications, Final Report*," File No. 27585.001, Dated June 2011.

3. Province of British Columbia report titled "*Ministry of Environments, Lands and Parks Water Management Division – A Design Brief on the Floodplain Mapping Study,*" File No. 35100-30/920-8962, Dated January 1993.



REV No.	DATE	BY	P.Eng.	REVISION DESCRIPTION

DRAWING TITLE
TEST PIT LOCATIONS

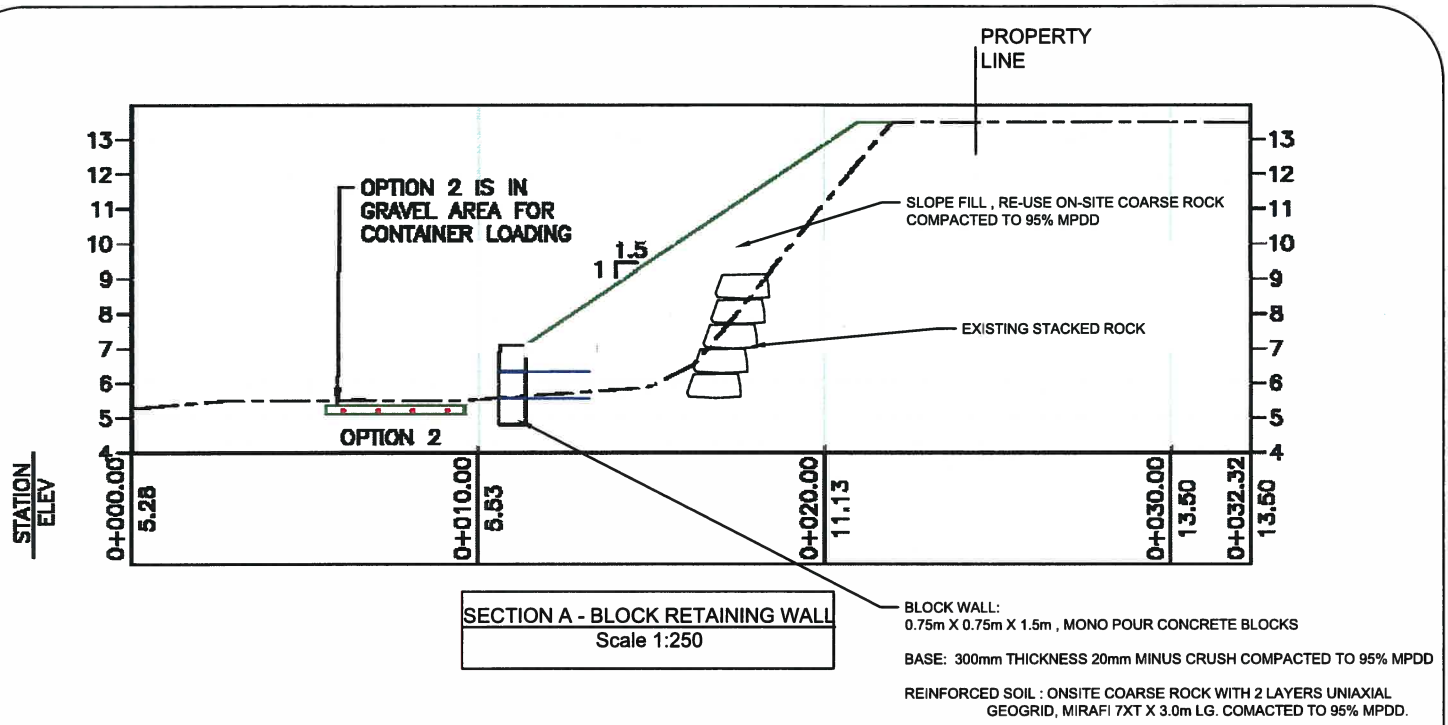
PROJECT NAME
JENSEN COVE ROAD, DFO
PORT HARDY, BC

LEGAL DESCRIPTION

ENGINEER'S SEAL

PLOT DATE	DRAWN BY
2019-07-10	LG
REVIEWED BY	SCALE
CH	1:500
PROJECT No.	DRAWING No.
F6903	01

LEA
Lewkowich Engineering Associates Ltd.



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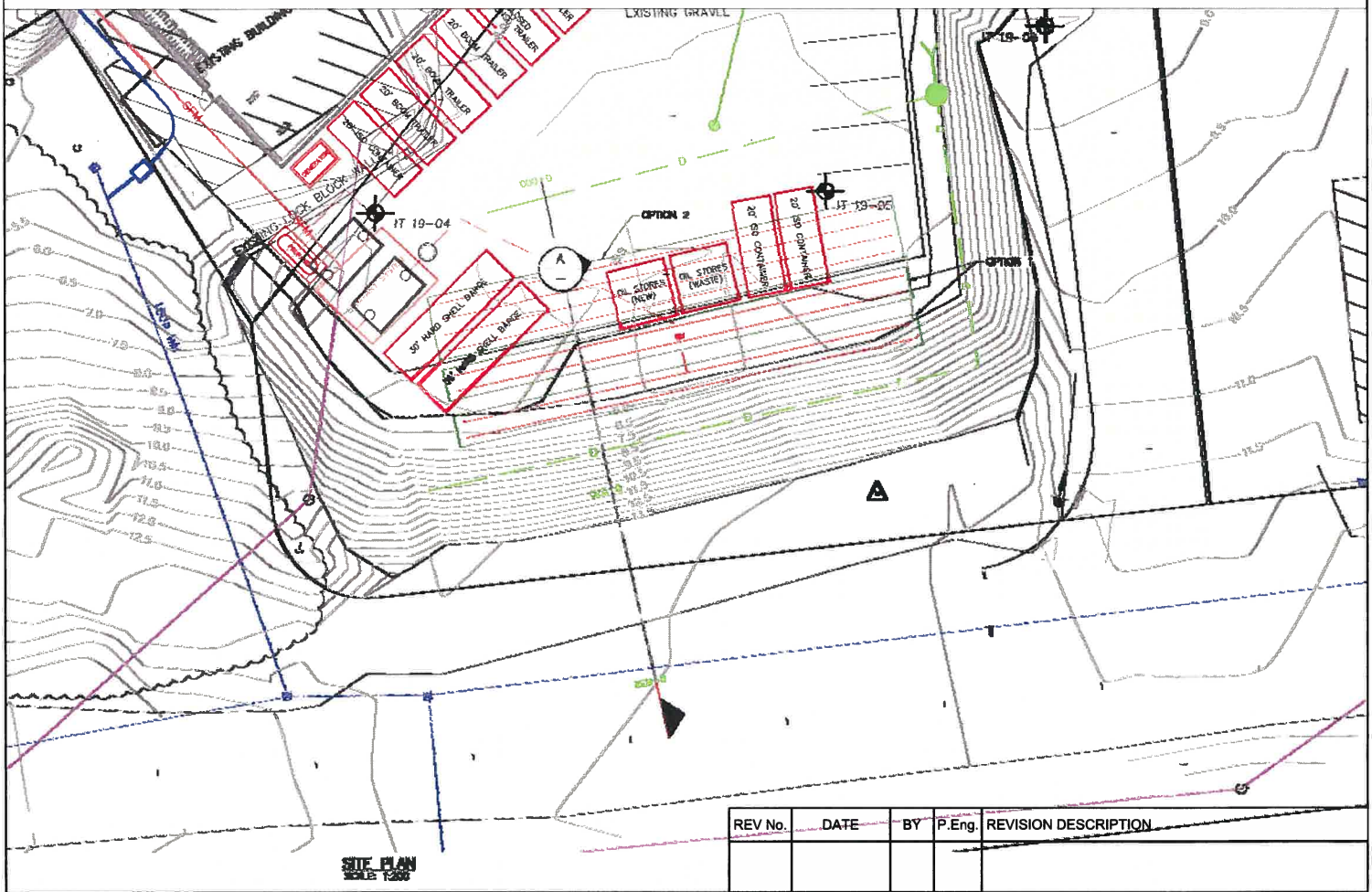


REV No.	DATE	BY	P.Eng.	REVISION DESCRIPTION

DRAWING TITLE
BANK STABILIZATION DETAIL

PROJECT NAME
CCG, OCEAN PROTECTION FACILITY
JENSEN COVE ROAD, PORT HARDY, BC

LEGAL DESCRIPTION

ENGINEER'S SEAL

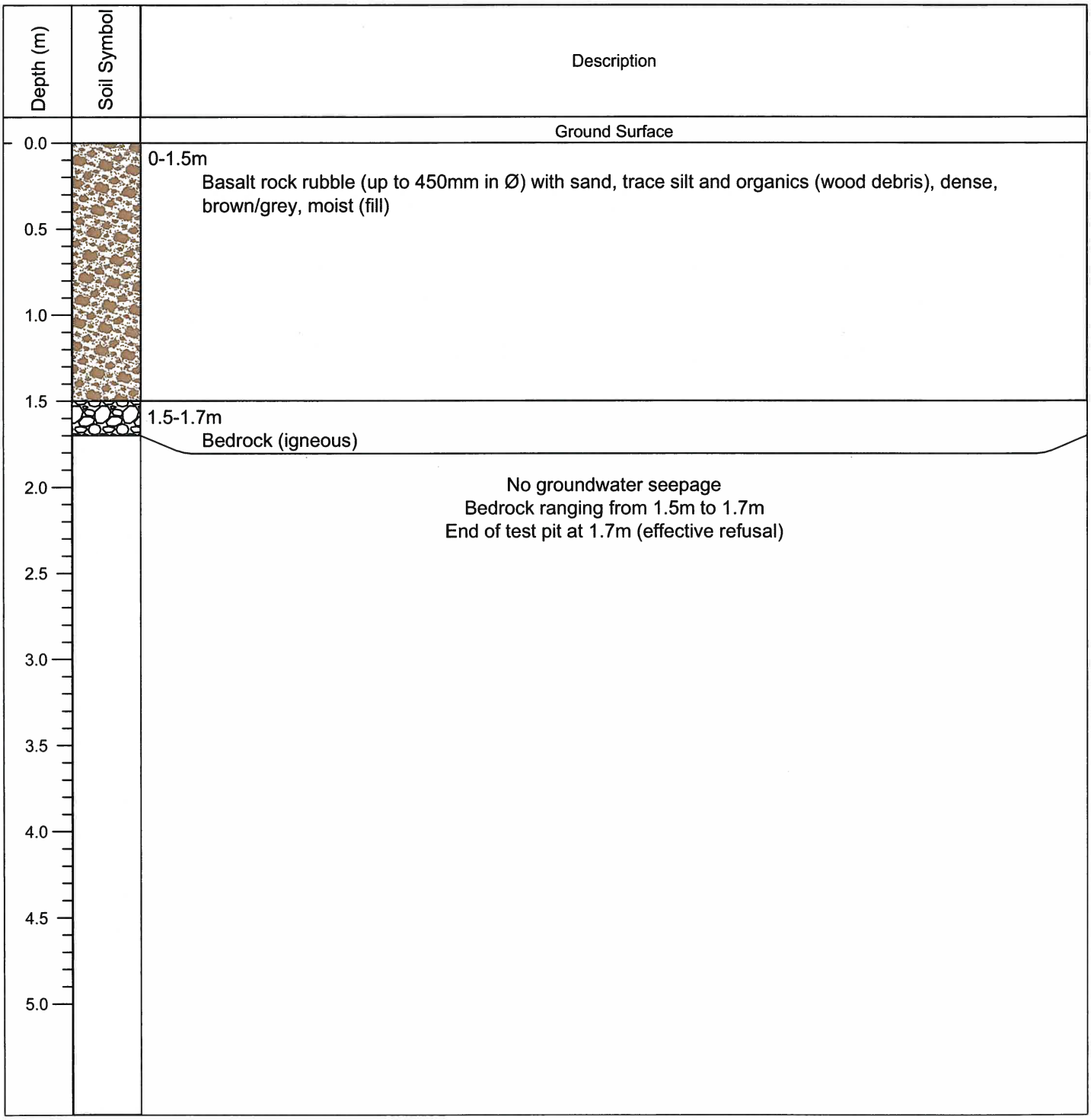
PLOT DATE	DRAWN BY
2019-09-03	JH
REVIEWED BY	SCALE
CH	1:100
PROJECT No.	DRAWING No.
F6903	02

LEA
Lewkowich Engineering Associates Ltd.

Lewkowich Engineering Associates Ltd.

TEST PIT LOG

File Number: F6903 TP19-01
Project: Jensen Cove Road, DFO
Location: Port Hardy, BC



Logged By: LG
Reviewed By: CH, M.A.Sc., P.Eng.
Digging Method: CAT 330L

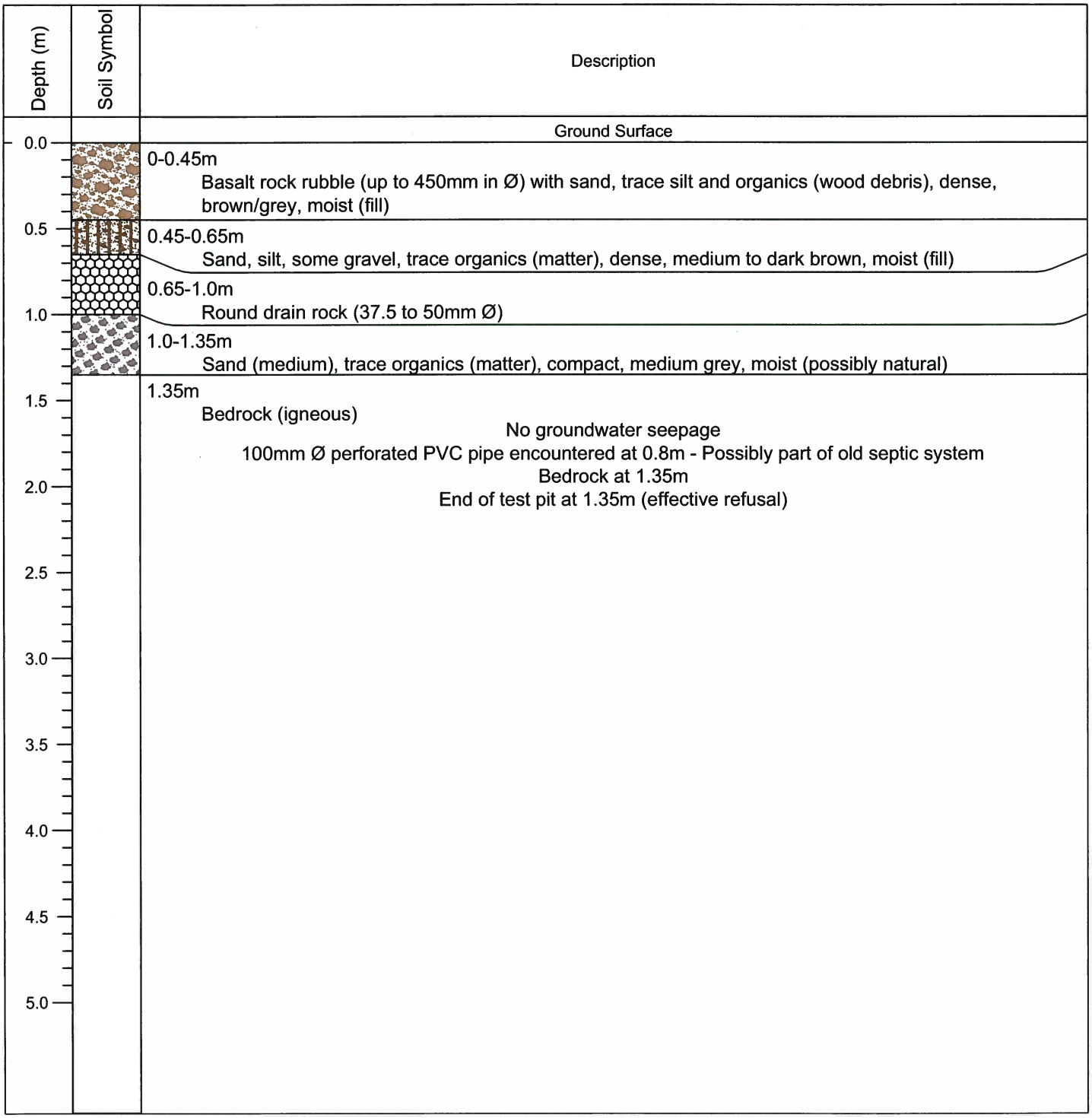
Date: July 8, 2019
Sheet: 1 of 1

1900 Boxwood Road
Nanaimo, British Columbia, V9S 5Y2
Phone: (250) 756-0355
Fax: (250) 756-3831
Email: geotech@lewkowich.com

Lewkowich Engineering Associates Ltd.

TEST PIT LOG

File Number: F6903 TP19-02
Project: Jensen Cove Road, DFO
Location: Port Hardy, BC



Logged By: LG
Reviewed By: CH, M.A.Sc., P.Eng.
Digging Method: CAT 330L

Date: July 8, 2019
Sheet: 1 of 1

1900 Boxwood Road
Nanaimo, British Columbia, V9S 5Y2
Phone: (250) 756-0355
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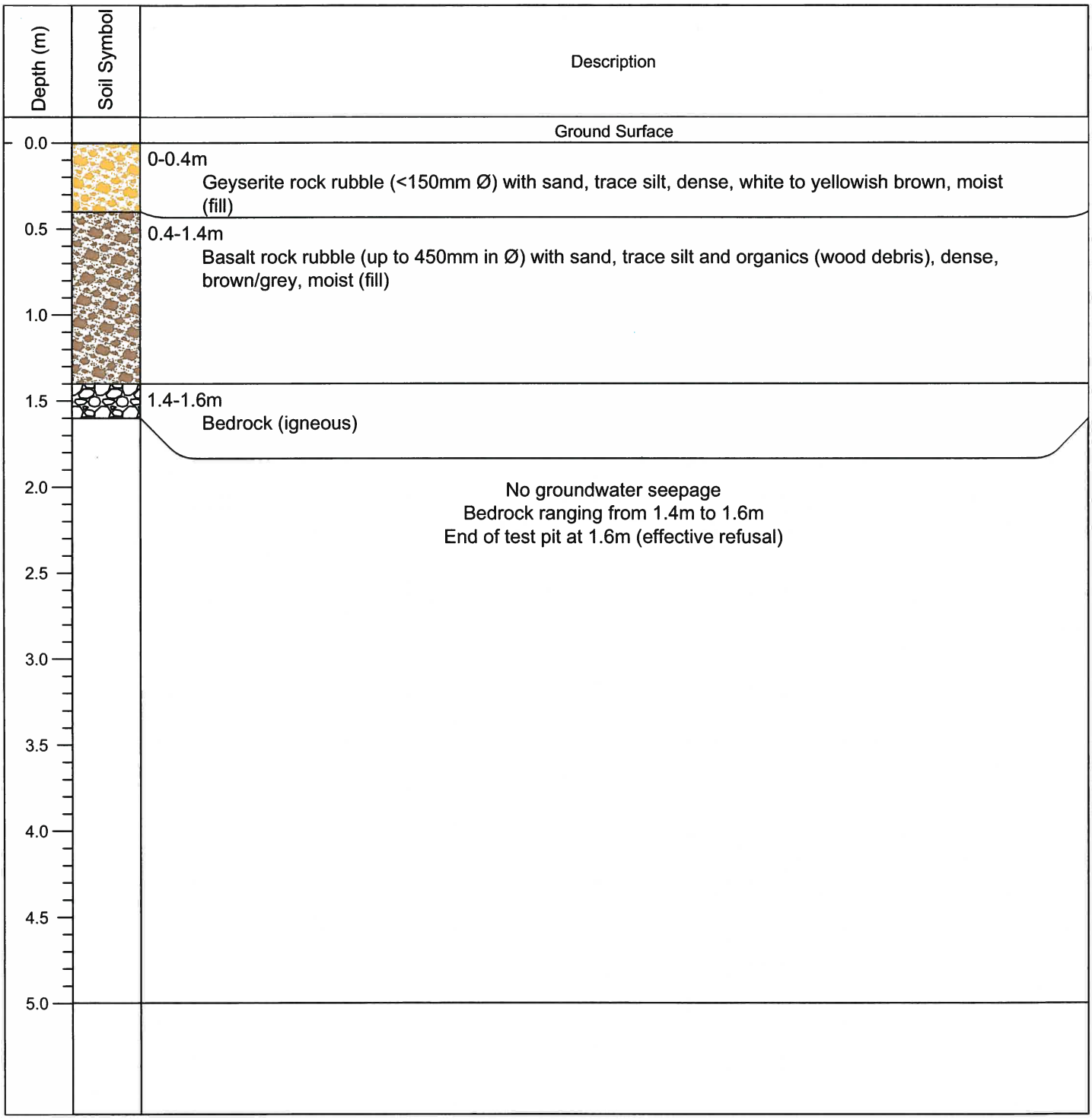
Email: geotech@lewkowich.com

Lewkowich Engineering Associates Ltd.

TEST PIT LOG

File Number: F6903 TP19-03
Project: Jensen Cove Road, DFO
Location: Port Hardy, BC



Logged By: LG
Reviewed By: CH, M.A.Sc., P.Eng.
Digging Method: CAT 330L

Date: July 8, 2019
Sheet: 1 of 1

1900 Boxwood Road
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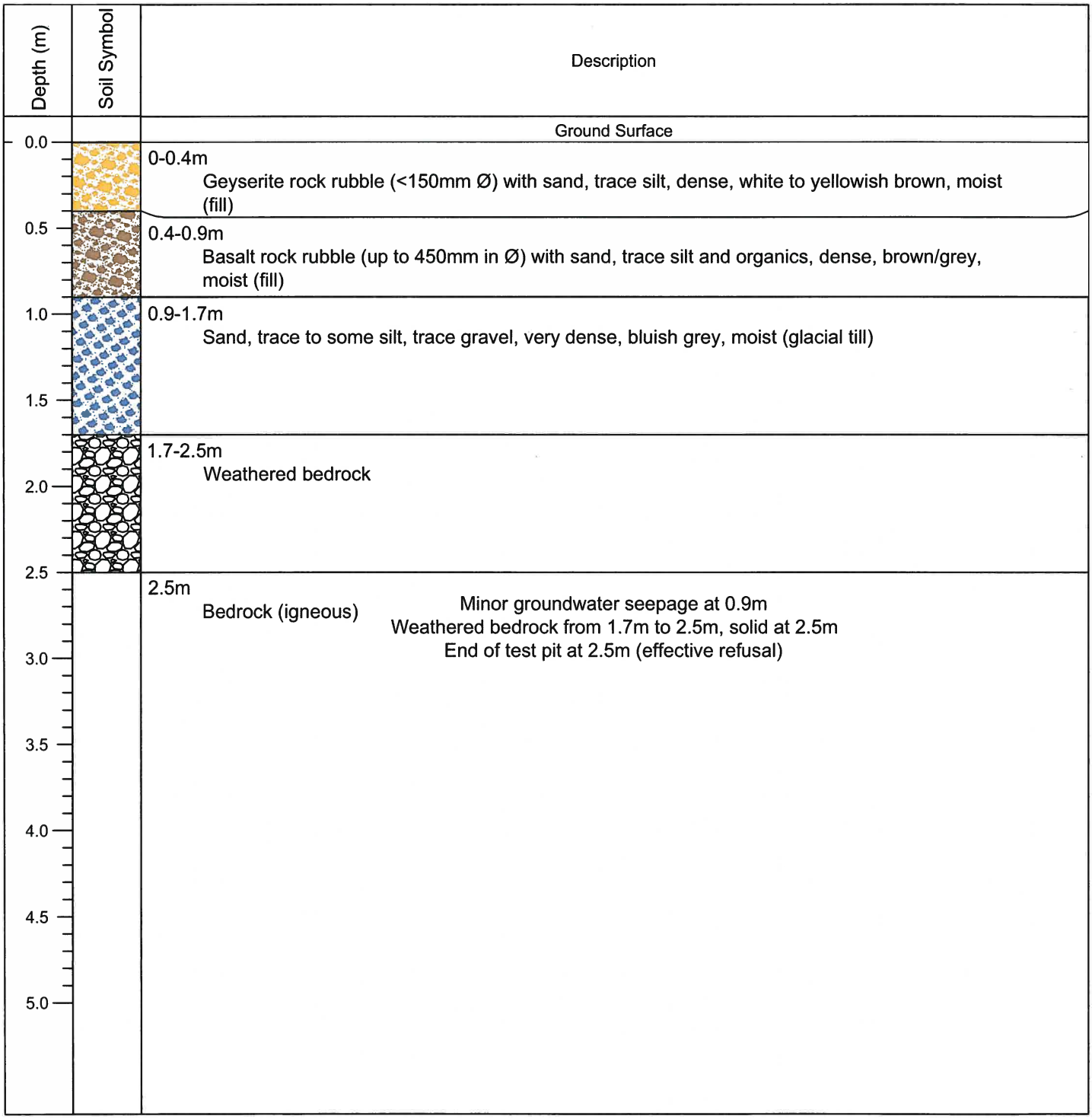
Email: geotech@lewkowich.com

TEST PIT LOG

Lewkowich Engineering Associates Ltd.

File Number: F6903 TP19-04
Project: Jensen Cove Road, DFO
Location: Port Hardy, BC



Logged By: LG
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Digging Method: CAT 330L

Date: July 8, 2019
Sheet: 1 of 1

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Lewkowich Engineering Associates Ltd.

TEST PIT LOG

File Number: F6903 TP19-05
Project: Jensen Cove Road, DFO
Location: Port Hardy, BC

Depth (m)	Soil Symbol	Description
		Ground Surface
0.0 – 0.5		0-0.95m Geyserite rock rubble (<150mm Ø) with sand, trace silt, dense, white to yellowish brown, moist (fill)
1.0 – 2.0		0.95-2.2m Basalt rock rubble (up to 450mm in Ø) with sand, trace silt and organics, dense, brown/grey, moist (fill)
2.5		2.2-2.6m Sand, trace to some silt, trace gravel, very dense, bluish grey, moist (glacial till)
3.0 – 3.5		2.6-3.6m Bedrock (igneous)
4.0 – 5.0		Minor groundwater seepage at 2.2m Bedrock ranging from 2.6m to 3.6m End of test pit at 2.6m (effective refusal)

Logged By: LG
Reviewed By: CH, M.A.Sc., P.Eng.
Digging Method: CAT 330L

Date: July 8, 2019
Sheet: 1 of 1

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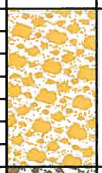
Lewkowich Engineering Associates Ltd.

TEST PIT LOG

File Number: F6903 TP19-06
Project: Jensen Cove Road, DFO
Location: Port Hardy, BC

Depth (m)	Soil Symbol	Description
		Ground Surface
0.0 – 0.5		0-0.7m Geyserite rock rubble (<150mm Ø) with sand, trace silt, dense, white to yellowish brown, moist (fill)
0.7 – 2.5		0.7-2.5m Basalt rock rubble (up to 450mm in Ø) with sand, trace silt and organics, dense, brown/grey, moist (fill)
2.5		2.5m Bedrock (igneous) No groundwater seepage Bedrock ranging from 1.9m to 2.5m End of test pit at 2.5m (effective refusal)

Logged By: LG
Reviewed By: CH, M.A.Sc., P.Eng.
Digging Method: CAT 330L

Date: July 8, 2019
Sheet: 1 of 1

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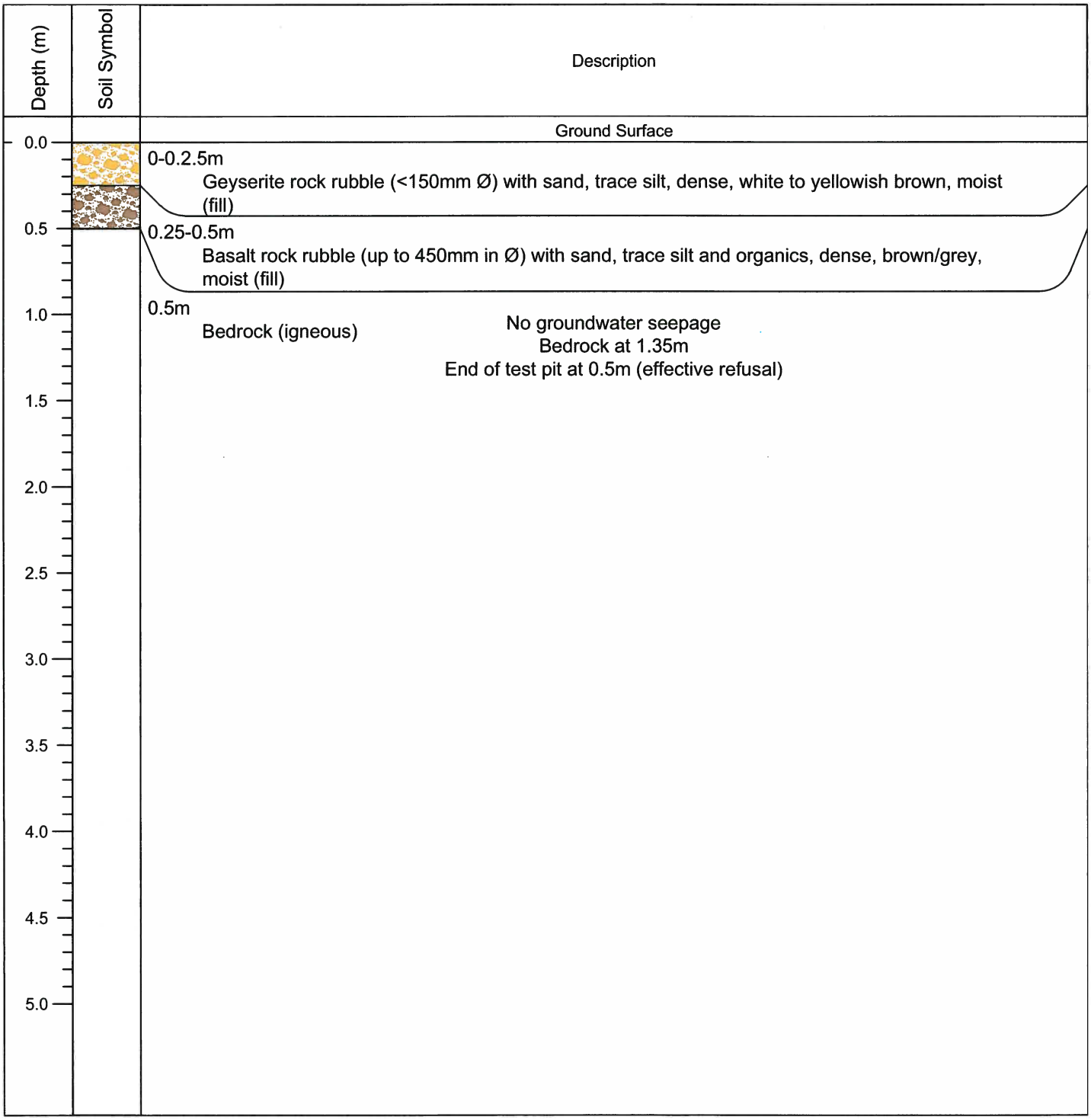
Lewkowich Engineering Associates Ltd.

TEST PIT LOG

File Number: F6903 TP19-07
Project: Jensen Cove Road, DFO
Location: Port Hardy, BC



Logged By: LG
Reviewed By: CH, M.A.Sc., P.Eng.
Digging Method: CAT 330L

Date: July 8, 2019
Sheet: 1 of 1

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Appendix C

Geotechnical Report - Marine

GEOTECHNICAL EVALUATION

for
CANADIAN COAST GUARD
DEPARTMENT OF FISHERIES AND OCEANS
OCEAN PROTECTION PLAN DEPOT

JENSEN COVE ROAD, PORT HARDY, BC

Prepared for:

MR. DON STORRY
DFO, SUPERVISOR REPONSE
RICHMOND, BC

Prepared by:

Mr. John Hessels, AScT, and Mr. Louis Chapdelaine, P.Geo

Reviewed by:

Mr. Chris Hudec, M.A.Sc.,P.Eng

of

Lewkowich Engineering Associates Ltd.

File No. F6903.02

Table of Contents

1. INTRODUCTION

As requested, Lewkowich Engineering Associates Ltd. (LEA) evaluated the subsurface conditions relating to the proposed ramp abutment and dock pile support structures. The purpose of this work was to provide information to allow for the detailed design of the waterside infrastructure. A previous report no. F6903.01 was completed by LEA for the landside works entitled "Geotechnical Assessment – Landside" Dated September 3, 2019.

This report was prepared in general accordance to the LEA proposal P3740 and subsequent email revisions to date. Written authorization to proceed with the work was received on July 22, 2019 from Mr. Don Storry, P.Eng. Senior Project Engineer, Real Property and Technical Support Division, Fisheries and Oceans Canada, Pacific Region, PO # F1802-180075.

2. ASSESSMENT OBJECTIVES

Our assessment, as summarized within this report, is intended to meet the following objectives:

i. Determine the subsurface characteristics through a subsurface drilling program for use in the design of the waterside infrastructure. We understand SNC Lavalin has been retained to provide the water side dock and ramp design for the facility.

ii. Identify any geotechnical deficiency that might impact the design and construction of the development, and prescribe the geotechnical works and any changes in the standards of the design and construction of the development that are required to ensure the land buildings, and works and services are developed and maintained safely for the use intended, and;

iii. Acknowledge that the Approving and/or Building Inspection Officers may rely on this report when making a decision on application for the development of the land.

3. ASSESSMENT METHODOLOGY

a. A preliminary site review was completed in concert with SLR Contracting on June 20, 2019. This review included hand core drilling in the foreshore area to determine depth of bedrock weathering and also to gather underwater information from the divers with respect to depth to bedrock and thickness of surficial soils over the proposed dock area.

b. Resonant sonic drilling with a 150 diameter casing and 75mm core size was conducted on August 19th to the 21st, 2019 to further characterize the sub surface soils and bedrock stratigraphy at depth. A Borehole Site Plan drawing F6903-03 shows the borehole locations. Two continuous rock core samples reaching to a depth of 14.2m (BH01-19) and 11.1m (BH01-20) were recovered.

c. The samples were then analyzed to determine details for the attached Rock Core logs BH01-19 and BH02-19 which include Core Recovery %, Core Condition, Discontinuity Spacing, RQD, Intact Rock Strength and Weathering.

d. Samples were also sent to Golder and Associates on September 12th, 2019 for Compressive/Poissons (2 samples per hole) and Brazilian Tests (2 samples per hole) to provide further strength data of the rock.

4. SITE CONDITIONS

4.1. General

a. The subject site consists of an industrial lot off Jensen Cove Road in Port Hardy, BC. The water side portion of the site is currently developed with significant fills and older ramp and dock structure that is partially deconstructed.

b. The natural topography of the foreshore area consists of moderately undulating igneous bedrock on a 4:1 inclination rising out of the Bay. Outside of the natural foreshore, the existing dock abutment includes up to a 6.5m thickness of sand and gravel protected with

100 to 250 kg class rock rubble infill into the bay. The proposed piling area shows a moderately sloped igneous bedrock ocean bottom with approximately a 0.6m thickness of rock rubble with some sediments on top. See attached Drawing F6903-03 showing estimated depths from LLWL to bedrock along the dock extent.

b. Overall, the lower portion of the site has been filled substantially over the bedrock to provide a flat area that is gently inclined down toward the ocean.

4.2. Soil Conditions and Bedrock

a. The soil strata observed in the two boreholes consisted of a 6.5m thickness of compact sand and gravel/ rock rubble fill over bedrock. Bedrock borehole samples were recovered and placed in core boxes to be reviewed by the Geologist at our office in Nanaimo, BC. Soils beyond the abutment fills and under the proposed dock consisted of a thin layer (0.6m) of 75mm minus rock rubble (Geyserite) likely spilled from barge loading operations.

b. Bedrock was cored at depth in two locations as shown on the appended Borehole Site Plan F6903-01. Rock Core Logs are appended at the end of this report. The rock is primarily characterized as amygdaloidal basalt from the Upper Karmutsen Formation formed during the Upper Triassic period. Basalt: medium to Dark grey-green, aphantic to plagioclase-phyric basalt flows, commonly amygdaloidal and locally exhibiting laminar flow features (vesicle trains) and pipe vesicles.

c. The Rock Core logs can be summarized as:

    i. Medium strong (25 - 50 mpa), very poor to excellent quality (RQD values ranged from 0 -92%). From the borehole logs, RQD values, core condition and discontinuity spacing the rock exhibits numerous discontinuities suggesting that the rock quality is relatively poor to fair

    ii. Based on the recovered core samples, the rock types can be described as a dark-grey

to light-green, amygdaloidal, plagioclase-phyric BASALT. Weathering characteristics ranged from fresh to completely weathered.

iii. From the examination of the core samples, a short section of "very broken" core, with evidence of clay gouge was identified. This suggests that a short possibly weak clay infilled layer may be present at this depth, that was subject to minor, localized faulting.

4.3 Groundwater Conditions

Groundwater levels in the boreholes were consistent with tidal influence of the adjacent ocean. Other groundwater flows from upland areas would likely flow or be perched atop of the original bedrock surface.

4.4 Shoreline Erosion

The natural foreshore is made up of igneous bedrock with a gentle to moderate inclination. Shoreline erosion is considered low to very low with very little recession of the bedrock expected over the 100 year life of the proposed structure. The developed portions of the shoreline show igneous rock rubble of varying sizes with some migration of materials seaward over time. We understand that the proposed works will include a revetment design provided by others that would be suitable for the intended use.

5. Acknowledgements

Lewkowich Engineering Associates Ltd. acknowledges that this report has been prepared for and at the expense of the Owner of the subject land. Lewkowich Engineering Associates Ltd. has not acted for or as an agent of the Governing Authority in the preparation of this report.

6. Closure

Lewkowich Engineering Associates Ltd. appreciates the opportunity to be of service on this project. If you have any comments, or if we can be of further service, please contact us at your convenience.

Respectfully Submitted,
Lewkowich Engineering Associates Ltd.

John Hessels, AscT
Senior Technologist

Louis Chapdelaine, P.Geo
Project Geoscientist

Reviewed by:

Chris Hudec, M.A.Sc., P.Eng
Senior Project Engineer

7. ATTACHMENTS

a. LEA Drawing F6503-03 Borehole Site Plan

b. LEA Rock Core Logs, BH19-01 and BH19-02

c. LEA Drawing F6503-04, Subsurface Profile – Dock and Abutment

8. REFERENCES

a. Lewkowich Engineering Associates Ltd., "*Geotechnical Assessment – Landside"*, September 3rd, 2019, File 6903.02

b. SNC Lavalin, "*General Arrangment",* July18, 2019, Project No. 666024, Sheet 001, Rev. PA.

ROCK CORE LOG

TEST HOLE No. SH19-01

Lewkowich Engineering Associates Ltd.

Job Number: F6903

Project: JENSEN COVE ROAD, PORT HARDY, BC		Elevation: N/A
Driller: DRILLWELL	Method: SONIC	Dates: 2019-08-20
Hole Orientation: N/A	Logged By: LC	Date: 2019-09-08

Drilling Details (▼ Water Table)	Depth (m)	Core Recovery %	Core Condition	Discontinuity Spacing	R.Q.D.	Intact Rock Strength	Weathering	Structural Discontinuity Description	Rock Symbol	Rock Mass Description	Tests
	6.8										
		95	V.BROKEN	20	29%	R3	SW - MW	Rough, with Rust Stained infill		plagioclase-phyric BASALT dark-grey with hematitic staining aphanitic with porphyritic texture	N/A
	7.5		SOLID - BROKEN	06	92%						
	8.0		BROKEN - V. BROKEN	14	33%	R2 - R3					
	9.5		SOLID - BROKEN	03	75%		SW				
	10.7	80	BROKEN	13	37%	R4	F - SW	Rough, with joints and veins infilled with Calcite and/or Quartz		amygdaloidal BASALT grey-green vesicular to amygdaloidal aphanitic with epidote filled veins	N/A
	12.6	90		09	55%	R3	F	Rough to smooth, with joints infilled with Calcite and/or Quartz and Epidote		plagioclase-phyric BASALT dark-grey with hematitic staining aphanitic with porphyritic texture	
	13.7	60	SHATTERED	26	0%						
	14.2									14.2m END OF HOLE	

CORE RECOVERY

Length of core run / core run x 100

R.Q.D.

Sum core lengths >100mm / length of core run x 100

DISCONTINUITY SPACING
No. of fractures/m

ROCK STRENGTH (MPa)	
R0 Extremely weak	<1
R1 Very weak	1-5
R2 Weak	5-25
R3 Medium weak	25-50
R4 Strong	50-100
R5 Very Strong	100-250
R6 Extremely strong	>250

WEATHERING	
F	F
SW	Slightly
MW	Moderately
HW	Highly
CW	Completely
RS	Residual Soil

File No. F6903

Drawn By: LC

Sheet 1 of 1

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ROCK CORE LOG

TEST HOLE No. SH19-02

Lewkowich Engineering Associates Ltd.

Job Number: F6903

Project: JENSEN COVE ROAD, PORT HARDY, BC		Elevation: N/A
Driller: DRILLWELL	Method: SONIC	Dates: 2019-08-20
Hole Orientation: N/A	Logged By: LC	Date: 2019-09-08

Drilling Details (Water Table)	Depth (m)	Core Recovery %	Core Condition	Discontinuity Spacing	R.Q.D.	Intact Rock Strength	Weathering	Structural Discontinuity Description	Rock Symbol	Rock Mass Description	Tests
	6.6	90	V.BROKEN	25	0%	R3	SW	Rough to Smooth, with Rust Staining, joints and veins infilled with Calcite and/or Quartz		plagioclase-phyric BASALT dark-grey with hematitic staining aphanitic with porphyritic texture and chloritic alteration	N/A
	7.6	80	SOLID - BROKEN	03	89%	R4	F	Rough, joints and veins infilled with Calcite and/or Quartz and Epidote		amygdaloidal BASALT grey-green vesicular to amygdaloidal aphanitic with epidote filled veins	N/A
	8.5		V.BROKEN	16	25%	R3	SW	Rough, Clay Gouge, joints and veins infilled with Epidote			
	9.6	95		07	18%	R0 - R1	HW - CW				
	10.6	100	BROKEN	18	90%	R3	F	Rough, joints and veins infilled with Calcite and/or Quartz and Epidote			
	11.1									11.1m END OF HOLE	

CORE RECOVERY

Length of core run / core run x 100

R.Q.D.

Sum core lengths >100mm / length of core run x 100

DISCONTINUITY SPACING
No. of fractures/m

ROCK STRENGTH (MPa)	
R0 Extremely weak	<1
R1 Very weak	1-5
R2 Weak	5-25
R3 Medium weak	25-50
R4 Strong	50-100
R5 Very Strong	100-250
R6 Extremely strong	>250

WEATHERING	
F	F
SW	Slightly
MW	Moderately
HW	Highly
CW	Completely
RS	Residual Soil

File No. F6903

Drawn By: LC

Sheet 1 of 1

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Appendix D

Designated Substances Survey

DEPARTMENT OF FISHERIES AND OCEANS

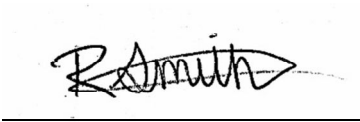
DESIGNATED SUBSTANCES SURVEY
6270 JENSEN COVE ROAD, PORT HARDY, BC

JANUARY 17, 2020

SIGNATURES

PREPARED BY

Gordon Philippe, B. Tech.
Environmental Technologist



Rachelle Smith, B. Sc.
Site Investigator

REVIEWED BY

Anthony Dickinson, M.A.Sc., P.Eng.
Senior Environmental Engineer

This report was prepared by WSP Canada Inc. for the account of DEPARTMENT OF FISHERIES AND OCEANS, in accordance with the professional services agreement. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The material in it reflects WSP's best judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. WSP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This limitations statement is considered part of this report.

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TABLES

APPENDICES

1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Department of Fisheries and Oceans (DFO) to carry out a Designated Substances Survey (DSS) of the Light Industrial/Residential Building located at 6270 Jensen Cove Road, Port Hardy, BC (hereafter referred to as the Subject Property or Subject Building(s)).

WSP understands that this survey is required for due diligence and regulatory compliance purposes as per WorkSafeBC (WSBC) Occupational Health and Safety Regulation (OHSR) and the Federal Asbestos Regulations.

The purpose of this survey is to determine the presence/absence of designated substances within the Subject Property and to provide designated substances information for management purposes in preparation for demolition of the Subject Building(s).

Mr. Gordon Philippe, B. Tech. AHERA certified Environmental Technologist and Ms. Rachelle Smith, B.Sc. Site Investigator of WSP conducted the on-site field works of this survey on December 18th, 2019.

2 REGULATORY CONTEXT

The Canadian Occupational Health and Safety Regulations and Canada Labour Code, Part II, which applies to all areas under federal jurisdiction, stipulates the requirements for protection of employees.

This survey is required to satisfy a building owner's requirements, under subsections 10.3 to 10.6 of the Canada Occupational Health and Safety Regulation (SOR/86-304) (COHSR), that stipulate that every employer shall keep and maintain a record of all hazardous substances that are used, produced, handled, or stored for use in the workplace. Furthermore, if there is a likelihood that the health or safety of an employee in a workplace is or may be endangered by exposure to a hazardous substance, the employer shall, without delay, carry out an investigation with regards to the risks and write a report exposing the recommendations and the procedures to control exposure to hazardous substances in the workplace.

Subsection 19.1 of the COHSR stipulates that the employer shall develop, implement and monitor a program for the prevention of hazards in the workplace.

This survey is required to satisfy the building owner's requirements under Section 20.112 of the British Columbia BC Occupational Health and Safety Regulation (OHSR) which requires that a hazardous building materials survey should be conducted by a qualified person prior to any demolition or renovation activity which might disturb hazardous materials.

For the purposes of this survey, designated substances and hazardous materials will be defined as:

- Asbestos-Containing Building Materials (ACMs);
- Lead materials and Paint containing Lead (LCMs);
- Mercury (Hg) and other Heavy Metals;

- Polychlorinated Biphenyls (PCBs);
- Crystalline Silica;
- Ozone Depleting Substance (ODS);
- Radioactive Materials (RAMs);
- Radon;
- Mould and/or Microbial Growth; and
- Flammable, Volatile, Explosive, or Potentially Toxic/Hazardous Materials.

2.1 ASBESTOS

Asbestos possesses refractory properties appropriate to multiple applications, notably in construction. Asbestos may be found in various friable materials found in a building (flocking, architectural coatings, insulating panels, seals, thermal insulation, acoustic panels, etc.) and non-friable materials (floor tiles, asbestos cement panels, etc.). Asbestos is a component of a variety of building materials manufactured before 1984 including mechanical insulation, floor tiles, ceiling tiles, caulking, plaster, and wiring. Workers and building occupants may be exposed during demolition/renovation activities. Exposure to asbestos can cause cancer and lung disease. The route of exposure is primarily by inhalation.

DFO, on behalf of its client, the Federal Government, must conform to all Federal, Provincial, Territorial and Municipal regulations, laws and stipulations regarding asbestos-containing materials located in buildings and installations belonging to or leased by its client. In this light, Public Works and Procurement Canada – Asbestos Materials Survey Evaluation of Asbestos-Containing Materials and Recommendations for Control (PSPC-AMS) regarding asbestos management was adopted. This Policy takes into account Federal legislation: The Canadian Labour Code (R.S.C, 1985, c. L-2) and the Canada Occupational Health and Safety Act (SOR/86-304), as well as the applicable Provincial legislation, British Columbia Occupational Health and Safety Regulation (OHSR B.C. Reg. 296/97 including amendments up to BC Reg. 142/2017, August 1, 2017)

For the purpose of this report, although employees working on the site are governed by Federal regulations, all local contractors performing work on the site are governed by the BC OHSR, and hence the scope of work will be consistent with the requirements of the BC OHSR, which are more explicit than the federal regulations.

Section 20.112 of the BC OHSR requires that a hazardous building materials survey should be conducted by a qualified person prior to any demolition or renovation activity which might disturb asbestos materials. The Canadian Occupational Health and Safety Regulations and Canada Labour Code, Part II, which applies to all areas under federal jurisdiction, stipulates the requirements for protection of employees.

In British Columbia as of February 1, 2012, the definition of asbestos-containing material (ACM) for manufactured articles or other material, other than vermiculite insulation, includes materials that contain at least 0.5% asbestos, as determined by methods referenced in BC OHSR section 6.1. Vermiculite insulation containing any asbestos, as determined by the referenced method, is also an ACM.

In the event that renovation or demolition is planned, an intrusive survey of the impacted areas must be performed as per Section 20.112 of the BC OHSR.

The Safe Work Practices for Handling Asbestos (WorkSafeBC, April 2017) describes the asbestos assessment requirements, management of asbestos on site, abatement operations and procedures (i.e., low, moderate and high risk), the use of personal protective equipment (PPE), and air monitoring requirements. The Safe Work Practices for Handling Asbestos also provides generic information that employers can use to develop their own site-specific procedures. If a worker is or may be exposed to potentially harmful levels of asbestos, the employer must develop and implement an exposure control plan meeting the requirements of Section 5.54 of the BC OHSR. The employer must also ensure that surveys and risk assessments on asbestos-containing materials are conducted by a qualified person. Specific procedures must be based on the risk assessments.

Prior to a building being demolished, renovated, or deconstructed, all materials containing asbestos, in the areas to be affected, must be removed.

The disposal of asbestos is regulated by the Province of British Columbia's Ministry of the Environment – Environmental Management Act (SBC 2003, c 53).

2.2 LEAD

Lead may be present in paint, solder used on copper pipes, caulking on cast iron water pipes, glazing on ceramic tiles, wires, roof vent boots, flashing, and electrical fixtures. Workers and building occupants may be exposed during demolition/renovation activities. Primary routes of exposure include inhalation, absorption through the skin and ingestion. Overexposure can affect the blood, kidneys, gastro-intestinal system, nervous system and reproductive system.

Lead based paints are defined as paint containing lead (no concentration is specified as a threshold for the definition) in the current WorkSafeBC regulations. BC Environmental Regulations and WorkSafeBC Guidelines require leachate testing (Toxicity Characteristic Leaching Procedure or TCLP) prior to disposal of lead waste in landfills.

Health Canada and the US Consumer Product Safety Improvement Act both consider a lead-containing surface coating as a paint that contains over 0.009% (90 mg/kg) dry weight of lead. This corresponds to the concentration of lead in paint that may present risk to pregnant women and children. The Surface Coatings Materials Regulations (SOR/2016-193) limits the total lead concentration in surface coating materials to 90 mg/kg (same unit of measure as parts per million - ppm) under subsection 2(1). Therefore, surface coating materials with lead concentrations that exceed 90 mg/kg or ppm (0.009% by weight) are considered to be lead-containing under Federal legislation.

To comply with WorkSafeBC regulations, if lead materials are identified at a site (this includes lead in paint), the employer must, before any renovation/demolition, have a qualified professional conduct a risk assessment and develop an exposure control plan, that contains safe work procedures, to protect workers that may be exposed to lead. When evaluating risk, the concentration of lead in paint and the activity must be considered together.

3 SURVEY OBJECTIVES

The purpose of this survey is to establish the presence / absence, location, and type of designated substances utilized in the construction of the Subject Building(s).

This information allows workers to take appropriate steps to prevent accidental exposure to these potentially harmful substances. This report should be provided to all maintenance workers, prospective contractors (and in turn to their sub-trades) who are likely to handle, come into contact with, or disturb building materials. Contractors who may work in close proximity to the identified materials and who may also disturb the materials should also be notified.

The primary objectives of the survey were to:

- Develop an up-to-date record, and gain a better understanding of the designated substances and/or hazardous materials that are present in areas of the Subject Property as may potentially be scheduled for renovation/demolition activities including materials considered to be suspect asbestos-containing materials (ACM) and lead-containing materials (LCM);
- Document the locations, applications, concentrations, quantities, and conditions of designated substances within the Subject Property Building(s) in order to provide workers, and prospective contractors, with adequate information to prevent accidental exposure to hazardous materials; and
- Provide recommendations for the management, safe removal, handling and disposal of the identified designated substances and hazardous materials as necessary.

3.1 SCOPE OF WORK

WSP's scope of work for this project included an intrusive DSS of the Subject Property Building(s), which consisted of:

- A thorough room by room visual inspection of the Subject Property Building(s) for designated substances;
- Intrusive review and collection of a representative number of bulk samples, from accessible areas, of materials suspected to contain asbestos or lead. The sample collection practices were undertaken in general accordance with WorkSafeBC Occupational Health and Safety Regulations Part 20, Construction, Excavation and Demolition, Section 20.112 Hazardous Materials. Samples were collected in order to determine the potential asbestos or lead content of the building materials and finishes present;
- Visual identification of Subject Property Building(s) materials which may contain mercury (e.g. thermostats and fluorescent lights);
- Visual identification of Subject Property Building(s) materials which may contain PCB;
- Visual identification of Subject Property Building(s) materials which may contain silica such as concrete and drywall joint compounds;
- Visual identification of Subject Property Building(s) materials which may contain ODS;
- Visual identification of Subject Property Building(s) materials which may contain RAM;
- Review of the Canadian radon potential map to determine the relative radon hazard;

- Review and reporting on areas of identified Subject Property Building(s) materials exhibiting signs of suspect mould growth,
- Visual identification of stored materials which may be volatile, flammable or explosive.
- Assessment of the likelihood of exposure to designated substances with recommendations for appropriate corrective action where required; and
- Preparation of this report summarizing the specific hazardous building materials identified through review and analysis.

The Site Sample Location Plans – Figures 2 and 3 showing bulk material sampling locations, are attached in Appendix A. Photographs of suspect designated substances and hazardous materials and associated areas were taken and are presented in Appendix B.

The survey involved intrusive sampling below flooring layers and within wall cavities; however, it did not include inspection within the electrical equipment (transformers, electrical panel, and hot water heater). The electrical equipment was considered inaccessible to the surveyors due to the charged nature of the equipment and as such, materials suspected to contain asbestos and other designated substances and hazardous materials may be present within the electrical equipment. Specific intrusive review and coring was undertaken to confirm the presence of:

- Foundation material exterior mastic on perimeter concrete foundation walls
- Foundation material building membrane between the top of the concrete foundation wall and underside of the sill pate wall framing;
- Wall material insulations and building papers between exterior cladding and interior panelling;
- Upper level hidden flooring materials under wood plank flooring and ceramic tile flooring;
- Attic insulation; and
- Roofing material layers.

4 METHODOLOGY

4.1 GENERAL SURVEY METHODOLOGY

On December 18th, 2019, Mr. Gordon Philippe, B. Tech. AHERA certified Environmental Technologist and Ms. Rachelle Smith, B.Sc. Site Investigator of WSP systematically conducted the DSS in general accordance with WorkSafeBC Occupational Health and Safety Regulations Part 20, Construction, Excavation and Demolition, Section 20.112 Hazardous Materials.

The DSS of the Subject Building(s) was conducted on-site by visually identifying and examining the Designated Substances as defined in Section 2 above for the purposes of documenting observations on locations, quantities, and respective conditions of materials. A physical examination was completed to assess the condition of materials and to examine, with limited intrusion, for readily accessible underlying layers. In situations where a suspected ACM or other designated substance extends into non-accessible areas, such as older layers of asbestos-containing flooring remaining under more modern applications of non-suspect flooring, it was assumed and herein reported that ACM were also

potentially present beyond the area available for examination. Site visit photographs taken of the in-situ suspect materials are presented in Appendix B.

Bulk samples of suspect ACMs and LCMs were collected for laboratory analysis of contents.

Collected suspect ACMs and LCMs samples were placed in plastic bags appropriate for the proposed analysis. The sample material descriptions, sample locations, and associated sample numbers were indicated on sample bags and the accompanying Chain-of-Custody (COC) forms. Chain-of-custody protocol was observed during handling and transportation of the bulk samples.

The bagged suspect ACMs and LCMs samples with COC forms were transferred to International Asbestos Testing Laboratories (iATL) for analysis. iATL is an accredited laboratory that follows methods that comply with the WorkSafeBC Occupational Health and Safety Regulations and Hazardous Waste Regulation as defined by the BC Ministry of Environment. iATL participates in the American Industrial Hygiene Association's (AIHA) Bulk Asbestos Proficiency Analytical Testing (BAPAT) Program.

Accessible areas of the Subject Building(s) were examined for visual / olfactory presence of suspected mould growth. Review was also conducted for elements or components which may contain lead products, mercury or other heavy metals, PCBs, crystalline silica, ODS, RAMs, flammable, volatile, explosive, or potentially toxic, or hazardous materials.

Review of radon potential mapping for Canada was done to determine the Subject Property associated Relative Radon Hazard Zone for radon.

The on-site observations and associated laboratory results form the basis for developing the recommendations provided within this report.

DSS material-specific procedures are documented in the following sections of this report.

4.2 ASBESTOS SURVEY METHODOLOGY

The surveyors inspected the study area for the presence of friable and non-friable ACM. Examples of ACM commonly found in buildings may include:

- Sprayed insulation;
- Rock insulation (vermiculite) in the cavities of concrete masonry unit (CMU) walls;
- Acoustic/texture finish;
- Drywall joint compound;
- Mechanical insulation/joint tape compound;
- Asbestos cement;
- Piping;
- Acoustic ceiling tiles;
- Vinyl floor tiles and vinyl sheet flooring;
- Plaster;
- Roofing material;

— Caulking/mastic.

Bulk samples of potentially suspect asbestos containing materials were collected for analysis to identify or confirm the presence/absence of asbestos. The suspect asbestos samples were collected by taking a small volume of material (approximately three to six square centimeters in area of full thickness material) considered to be representative.

The bulk sample collection frequency for suspect asbestos materials was consistent with recognized industry standards and principles of good occupational hygiene practice for a DSS in North America. The number of samples collected was based on experienced professional judgment in consideration of, but not necessarily limited to, the era of construction, and uniformity of materials, and size of area of homogeneous materials in accordance with the material specific quantities detailed in the Bulk Material Sample Collection Guide table within the Safe Work Practices for Handling Asbestos manual (WorkSafeBC, 2017).

The number of bulk samples required, in order to establish whether a material is asbestos-containing according to O. Reg. 278/05 and Safe Work Practices for Handling Asbestos Manual, is summarized in Table 1.

Table 1 Minimum Number of Bulk Samples to be Collected Under WorkSafe BC Guidelines Regarding Demolition and Asbestos Waste Materials

BULK MATERIAL SAMPLES TABLE			
ITEM	**TYPE OF MATERIAL**	**SIZE OF AREA OF HOMOGENEOUS MATERIAL**	**MINIMUM NUMBER OF BULK MATERIAL SAMPLES TO BE COLLECTED**
1.	Surfacing materials, including textured coatings, drywall mud, plasters, and stucco	Less than 90 square metres	3 of each type of surfacing material
		90 or more square metres, but less than 450 square metres	5 of each type of surfacing material
		450 or more square metres	7 of each type of surfacing material
2.	Sprayed insulation and blown-in insulation, including sprayed fireproofing and vermiculite insulation (including vermiculite insulation within concrete masonry units - CMUs).	Less than 90 square metres	3
		90 or more square metres, but less than 450 square metres	5
		450 or more square metres	7
3.	Flooring, including vinyl sheet flooring (and backing) and floor tiles	Any size	1 sample per flooring type in each room (and 1 from each layer of flooring)
4.	Mechanical insulation, including duct taping, pipe insulation, elbows, and boiler/tank insulation	Any size	3 samples per house or mechanical or boiler room

BULK MATERIAL SAMPLES TABLE			
ITEM	**TYPE OF MATERIAL**	**SIZE OF AREA OF HOMOGENEOUS MATERIAL**	**MINIMUM NUMBER OF BULK MATERIAL SAMPLES TO BE COLLECTED**
5.	Roofing materials, including felting and shingles	Less than 90 square metres	1 from each layer of roofing material
		90 or more square metres, but less than 450 square metres	2 from each layer of roofing material
		450 or more square metres	3 from each layer of roofing material
6.	Asbestos cement (transite) board and pipe	Any size	1 sample
7.	Other materials	Any size	1 sample per type of material

Representative bulk samples were collected of Subject Building(s) materials that could potentially contain asbestos. The bulk suspect asbestos samples were analyzed by iATL following US EPA 600, R93-116 using Polarized Light Microscopy (PLM) "Method for the Determination of Asbestos in Bulk Building Materials". The analytical results for asbestos content of the bulk material samples are presented in the Laboratory Reports, included in Appendix C.

Based on WSP's professional opinion, the following materials were assumed not to contain asbestos during this survey and were classified as non-asbestos materials:

- Metal doors with wooden or hollow cores;
- wood siding;
- wood trim;
- wood doors
- structural timbers;
- dimensional lumber;
- plywood;
- Pink and yellow fiberglass bat insulation without backing paper;
- Metal roof cladding;
- Aluminum soffits, gutters and downspouts; and
- Cabinetry.

4.3 LEAD SURVEY METHODOLOGY

The surveyors selected sample locations where it appeared that the paint application was most representative of all areas on which it was applied. Bulk paint (surface coating) samples of each distinct colour observed on the exterior and interior of the Subject Building(s) were collected from discrete locations with every attempt to minimize damage. The suspect paint samples were collected by taking a moderate volume of material (approximately 100 to 150 square centimeters in area of full thickness surface coating material) considered to be representative, and analyzed to identify or confirm the presence/absence of lead.

Bulk paint (surface coating) samples were collected with the aid of dedicated paint sampling hand tools equipped with replaceable metal scraper bits and/or blades. The bits and blades were cleaned or replaced subsequent to each sampling event to prevent inadvertent transfer.

The aforementioned building materials review and bulk material sample collection for analysis of potential lead based surface coatings was consistent with recognized industry standards and principles of good occupational hygiene practice for a DSS in North America.

Representative bulk paint samples were collected of Subject Building(s) surface coatings that could potentially contain lead. Lead analyses of bulk suspect paint (surface coating) samples were performed following ASTM Method, ASTM D3335-85A "Standard Method to Test for Low Concentrations of Lead in Paint by Atomic Absorption Spectrophotometry".

4.4 MERCURY

The surveyors inspected the subject buildings for equipment which is likely to contain mercury. Mercury is used in thermometers, batteries and some electrical switches. Mercury vapour is present as a vapour in fluorescent lights, metal halide lights and mercury vapour lights. Pertinent information was collected and recorded when available, from potentially contaminated equipment. Information included manufacturer, dates, model and serial numbers, and quantities of contaminant. No samples were collected or analyzed.

4.5 POLYCHLORINATED BIPHENYLS (PCB)

The surveyors inspected the Subject Building(s) for equipment which may contain PCBs. Equipment that is generally suspected of containing PCBs includes lamp ballasts, transformers, hydraulic fluid, compressors, switchgears, capacitors and other electric equipment. Pertinent information collected from potentially contaminated equipment included manufacturer, dates, model and serial numbers, and quantities of contaminant was recorded when available. No samples were collected or analyzed.

4.6 CRYSTALLINE SILICA

The surveyors inspected the Subject Building(s) for the presence of concrete or mineral-composite building materials which may contain crystalline silica. Silica is present in materials such as such as glass, concrete, masonry, stone, ceramic tile and mortar which are prevalent materials in building construction. No samples were collected or analyzed.

4.7 OZONE DEPLETING SUBSTANCES (ODS)

The surveyors inspected the Subject Building(s) for equipment which may contain ODS. Information on the type of equipment and potential refrigerants used was recorded, where available. No samples were collected or analyzed.

4.8 RADIOACTIVE MATERIALS (RAMS)

The surveyors visually inspected the Subject Building(s) for the presence of materials known to contain RAMs; low concentration sources are commonly used for ionization chamber type smoke detectors and unpowered emergency exit signs.

4.9 RADON

The surveyors reviewed the location of the Subject Property relative to the findings of The Ministry of Health completed regional study of radon in homes in British Columbia. The results of the study were published in a document entitled Cross-Canada Survey of Radon Concentrations in Homes - Final Report. (https://www.canada.ca/en/health-canada/services/environmental-workplace-health/radiation/radon/cross-canada-survey-radon-concentrations-homes-final-report.html).

The location of the Subject Property was also reviewed for Relative Radon Hazard Zoning Hazard as denoted on the Radon Potential Map Canada (REM Corp., 2012).

4.10 MOULD AND OTHER MICROBIAL CONTAMINANTS

The surveyors inspected the Subject Building(s) for the presence of mould. This included a non-intrusive visual assessment of accessible building material surfaces and components in areas conducive to mould growth for evidence of obvious visible presence of water damage and/or suspected mould growth. No samples were collected or analyzed.

4.11 FLAMMABLE, VOLATILE, EXPLOSIVE, OR POTENTIALLY TOXIC/HAZARDOUS MATERIALS

The surveyors inspected the Subject Building(s) for the presence of Flammable, Volatile, Explosive, or Potentially Toxic/Hazardous Materials. This included a non-intrusive visual assessment of accessible building material surfaces and components. No samples were collected or analyzed.

5 SITE OVERVIEW

5.1 SUBJECT PROPERTY BUILDINGS DESCRIPTION

The Subject Property investigated during this DSS included the two-level Light Industrial/Residential Building located at 6270 Jensen Cove Road in Port Hardy, BC. (refer to the Sample Location Plans - Figure 1 included in the attached Appendix A).

5.1.1 LIGHT INDUSTRIAL/RESIDENTIAL BUILDING

Table 2 Light Industrial/Residential Building Description

ITEM	DESCRIPTION
Construction and Renovation Date(s)	Assumed to have been originally constructed mid 20th century and has likely undergone extensive renovations and upgrades in order to maintain the residence.
Building Footprint, Number of Floors, and Occupancy Area Living Space	The Light Industrial/Residential Building is a two-level structure with a total occupancy usage area of approximately 245 m^2 (2,635 sq. ft.). The occupancy lower (ground) level of approximately 165 m^2 (1,775 sq. ft.) is comprised of an open warehouse with three (3) separate roll-up (garage style) access doors and a separate washroom area in the east corner of the building. The occupancy upper (second floor) level of approximately 80 m^2 (860 sq. ft.) is comprised of a two (2) bedroom centrally aligned apartment with northwest balcony and attached access staircase. The upper (second floor) level side attic space with sloping ceiling and a footprint of approximately 32 m^2 (345 sq. ft.) is aligned along the northeast side of the apartment. The roof peak attic space with a footprint of approximately 71.5 m^2 (770 sq. ft.) is above the apartment. A ground level storage room of approximately 6 m^2 (65 sq. ft.) is located under the access staircase. A ground level electrical shed of approximately 12 m^2 (130 sq. ft.) with transformers and electrical panels is attached to the southeast side of the building A ground level storage shed of approximately 8 m^2 (85 sq. ft.) with former water pump manifold (assumed marine) is attached approximately midway along the southwest side of the building.

ITEM	DESCRIPTION
Use of Building	Light Industrial on the lower (ground) level with residential Occupancy on the upper (second floor) level.
Structure	Wood frame construction over concrete perimeter foundation and concrete floor slab.
Exterior Finishes	Painted wood plank exterior siding. Painted metal entry and roll-up garage doors. Original metal-framed windows date-stamped 1987 and replacement metal-framed windows date-stamped 2009. Corrugated metal roof paneling. Exterior concrete parking slab. Covered wooden staircase leading to upper level northwest wood framed balcony.
Heating, Ventilation, and Air Conditioning (HVAC)	Base of wall mounted electric baseboards in lower level washrooms and adjoining common room Base of wall mounted electric baseboards and set in-wall-mounted heater in the upper level apartment.
Flooring	Base flooring is concrete floor slab on the lower level and plywood on the upper level. Upper level floor surface finishes include wood plank flooring and ceramic floor tile.
Interior Walls	The occupancy lower (ground) level is finished with painted plywood and modern vinyl sheet panels. The occupancy upper (second floor) level apartment is finished with painted drywall with drywall joint compound.
Ceiling	The occupancy lower (ground) level washrooms and adjoining common room are finished in unpainted and painted plywood. The occupancy lower (ground) level open warehouse is finished with painted drywall with drywall joint compound. The occupancy upper (second floor) level apartment is finished with drywall with drywall joint compound and ceiling texture coat.
Attic	The upper (second floor) level side attic space has painted drywall with drywall joint compound on the walls and ceiling and exposed unfinished plywood sub-floor. The roof peak attic space is unfinished with exposed wood framing and full coverage fibreglass batt insulation overlying the joists above the occupancy apartment level below.

6 OBSERVATIONS AND RESULTS

Information in this section of the report contains detailed information on the assessment and actions to be undertaken as a result of the bulk sampling program. Specifications that outline specific abatement procedures are recommended when tendering the renovation/demolition work.

This report and the asbestos management plan should be updated upon completion of the demolition to reflect the remediation of designated substances from various sections of the building. A close-out report stating that the materials are no longer present is also required once the materials are removed.

Contractors and maintenance personnel should be warned of the possibility of undisclosed materials when breaking into enclosed areas. Friable and non-friable building materials discovered in enclosed areas should be treated as asbestos-containing until proven otherwise and other substances, self-evident as designated substances, should be handled in a likewise fashion. In all cases, these materials must be handled and disposed of in accordance with the Safe Work Practices for Handling Asbestos (WorkSafeBC, April 2017).

ACM samples collected from the building are summarized in three tables. The first is for laboratory confirmed ACM, the second for materials tested and found to contain asbestos at concentrations below 0.5% (the threshold for ACM in BC) and the third is for materials that were tested and found to be "non-detect" for asbestos. The results for the coating materials that were tested for lead are summarized in one table. A separate table contains the laboratory results for the Toxicity Characteristic Leaching Procedure (TCLP) testing conducted for LCP coatings on non-metallic substrates.

For materials containing asbestos, recommended actions for management, repair or removal of these materials are based on the requirements and procedures specified by PSPC Asbestos Management Standard (AMS) (federal), The Safe Work Practices for Handling Asbestos (WorkSafeBC, April 2017) and the WorkSafeBC (WSBC) Occupational Health and Safety Regulation (OHSR) (provincial) and have been suggested based on the type of disturbance which is anticipated or likely. Alternate handling, repair and removal procedures must comply with the requirements of PSPC AMS and WSBC OHSR.

6.1 SUSPECTED ASBESTOS-CONTAINING MATERIALS

A total of forty-nine (49) representative bulk samples were collected from the Subject Building(s) and submitted for laboratory analysis of asbestos content.

Intrusive exploratory examinations were made during the survey to look for potentially hidden or trapped older layers of building materials.

Site specific intrusive review and coring was undertaken to confirm the presence of:

- Foundation material exterior mastic on perimeter concrete foundation walls
- Foundation material building membrane between the top of the concrete foundation wall and underside of the sill pate wall framing;
- Wall material insulations and building papers between exterior cladding and interior panelling;

- Upper level hidden flooring materials under wood plank flooring and ceramic tile flooring;
- Attic insulation; and
- Roofing material layers.

Certain building materials which have historically contained asbestos were not included in the survey since they were inaccessible, are used in a random fashion, or have a low risk of asbestos fibre release.

These materials include:

- Buried services such as underground piping: these pipes were commonly manufactured from a non-friable form of asbestos cement but are inaccessible for sampling without excavation work. Site drawings should be consulted and reviewed to ascertain the presence or absence of such structures.
- Floor levelling compounds; these materials were used in a random fashion, may or may not contain asbestos, and require demolition of floor finishes to access for sample collection.
- Packing materials in valves, fittings, etc., of the former water pump manifold (assumed marine) may be present but are inaccessible without demolition activities (e.g. within concealed areas behind bulkheads and/or below grade).

The survey did not include inspection within the electrical equipment (transformers, electrical panels, and hot water heater). These pieces of electrical equipment were considered inaccessible to the surveyors as they were energized at the time of the inspection.

As such, the electrical equipment are suspected to potentially contain asbestos and may be present within these inaccessible areas, including:

- electrical wiring insulation,
- electrical circuit breakers and mounts,
- underground utilities such as sewers or drain lines,
- electrical conductors,
- high temperature gaskets,
- Metal halide light fixture insulation,

Prior to demolition or renovation activities, materials suspected of containing asbestos (suspect ACM) should be sampled and analyzed to determine the type and quantity of asbestos present. If asbestos is present in these materials, it should be removed in accordance with the PSPC AMS and WSBC OHSR.

However, it should be noted that ACMs can be concealed by existing building finishes. If demolition or renovation work reveals materials likely to contain asbestos, all work must be discontinued, and the materials must either be considered as containing asbestos or samples of the material must be collected for analysis to determine whether asbestos is present. If laboratory tests determine that the material contains asbestos, it must be handled in accordance with all applicable asbestos regulations and procedures.

6.2 ASBESTOS

SUMMARY OF ASBESTOS-CONTAINING MATERIALS

A total of forty-nine (49) representative bulk samples were collected from the Subject Building and submitted for laboratory analysis of asbestos content.

The table below summarizes the results of the representative bulk suspect material samples collected from the Subject Building which based on the corresponding iATL results, WorkSafeBC criteria, and site review assessment, are considered **Asbestos-Containing**.

Table 3 Asbestos- Containing Materials

MATERIAL LOCATION/ DESCRIPTION	ASSESSMENT[1]	ACTION[2]	PHOTO[3]
Black Caulking Upper level apartment sliding door Upper level apartment SE bedroom window (refer to Site Sample Location Plan - Upper Level – Figure 3 in the attached Appendix A).	**Sample IDs:** **19A-6270JC-25** **(Lab Sample ID 6942075)** **19A-6270JC-26** **(Lab Sample ID 6942076)** **Concentration: 1.2 - 1.3%** **Chrysotile** Condition: Good Material: Non-Friable Accessibility: A (Areas of the building within reach of all building users. Window and door caulking is strongly adhered to the substrate window framing ang glazing and is anticipated to potentially become disturbed during window/door removal.)	If material is to be removed Action 5 "Proactive ACM Removal" is required. Remove ACM in lieu of repair may be considered, even if it is in Good condition at locations, where ACM is easily accessible, limited in quantity, and removal would be cost-effective. If material is not removed Action 7 "Routine Surveillance" is required. Routine surveillance of the ACM is to be instituted. Trained workers or service providers must use appropriate asbestos precautions (low, intermediate or high) during disturbance of the remaining ACM (i.e., sanding, drilling, coring or cutting).	Refer to photograph(s) on Page vii in Appendix B

1 For sample ID and concentration levels refer to Appendix C: Certificates of Analysis – Asbestos.

2 Actions and procedures recommended are specified in the PSPC Asbestos Management Standard (AMS) (refer to Appendix E).

For relevant photographs taken during the survey refer to Appendix B: Site Photographs.

The windows and sliding glass doors of the Subject Site with asbestos-containing black caulking (1.2 - 1.3% Chrysotile) should be removed using safe work practices and procedures outlined in the WorkSafeBC publication "Safe Work Practices for Handling Asbestos" and the Occupational Health and Safety (OHS) Guideline G6.8 prior to demolition activities.

The table below summarizes the results of the representative bulk suspect material samples collected from the Subject Building which based on the corresponding iATL results, WorkSafeBC criteria, and site review assessment, were found to have concentration of asbestos less than the WorkSafeBC criteria of 0.5% asbestos, as determined by methods referenced in BC OHSR section 6.1 and are not considered an asbestos-containing material within British Columbia.

Table 4 Asbestos-Detected in Materials less than WorkSafeBC criteria of 0.5% asbestos

MATERIAL LOCATION/ DESCRIPTION	ASSESSMENT[1]	ACTION[2]	PHOTO[3]
Black Mastic On exterior perimeter foundation (refer to Site Sample Location Plan - Lower Level– Figure 2 in the attached Appendix A).	**Sample ID: 19A-6270JC-01 (Lab Sample ID 6942051)** **Concentration: 0.25% Chrysotile** Condition: Poor Material: Friable Accessibility: A (Areas of the exterior foundation of the building within reach of all building users although not common. The remaining mastic is adhered to the exterior concrete foundation and is patchy in appearance having apparently degraded over time. Disturbance is possible during planned demolition activities such as cutting, breakage or other destructive activities.)	Action 5 – Proactive Removal – Removal of black mastic from the exterior perimeter foundation walls may be considered, where ACM is easily accessible, limited in quantity, and removal would be cost-effective. Consideration should be given towards its removal based on commonly implemented safety principles for maintaining As Low As Reasonably Achievable (ALARA) risk of exposure. Trained workers or service provider must use appropriate asbestos precautions (low, intermediate or high) during disturbance of the remaining ACM (i.e., drilling, coring or cutting).	Refer to photograph on Page v in Appendix B
1 For sample ID and concentration levels refer to Appendix C: Certificates of Analysis – Asbestos. 2 Actions and procedures recommended are specified in the PSPC Asbestos Management Standard (AMS) (refer to Appendix E). 3 For relevant photographs taken during the survey refer to Appendix B: Site Photographs.			

The black mastic on the exterior perimeter foundation was found to have a concentration of asbestos below the WorkSafeBC limit of 0.5%. Consideration should be given towards its removal based on commonly implemented safety principles for maintaining As Low As Reasonably Achievable (ALARA) risk of exposure. If so undertaken, the removal should be completed using safe work practices and procedures outlined in the WorkSafeBC publication "Safe Work Practices for Handling Asbestos" and the Occupational Health and Safety (OHS) Guideline G6.8 prior to demolition activities.

SUMMARY OF BULK SAMPLES IDENTIFIED AS "NON-ASBESTOS"

The table below summarizes the results of bulk suspect material samples collected from the Subject Building and submitted for laboratory analysis which had no detectable concentrations of asbestos, and therefore can be considered as "non-asbestos" in accordance with the WorkSafeBC (WSBC) Occupational Health and Safety Regulation (OHSR).

Table 5 Summary of Bulk Samples Identified as "Non-Asbestos"

MATERIAL LOCATION	MATERIAL DESCRIPTION	SAMPLE ID [1]
Electrical room northeast wall off back of the main building.	Building Paper	19A-6270JC-02
Upper level residence rounded corner of column - base layer.	Drywall Joint Compound (DWJC)	19A-6270JC-03
Upper level residence rounded corner of column - surface layer.	DWJC	19A-6270JC-04
Upper level residence living room northeast wall below slope ceiling.	DWJC	19A-6270JC-05
Upper level residence living room northeast sloped ceiling.	DWJC	19A-6270JC-06
Upper level residence living room northeast extent of northwest wall.	DWJC	19A-6270JC-07
Upper level residence next upper corner of entry doorframe.	DWJC	19A-6270JC-08
Upper level residence living room northwest extent of southwest wall.	DWJC	19A-6270JC-09
Upper level residence kitchen central portion of southwest wall.	DWJC	19A-6270JC-10
Upper level residence access hallway corner next to kitchen.	DWJC	19A-6270JC-11
Upper level residence living room southeast wall near side attic access.	DWJC	19A-6270JC-12
Upper level residence access hallway corner between entries to bathroom and SE bedroom.	DWJC	19A-6270JC-13
Upper level residence bathroom north corner wall at sloping ceiling.	DWJC	19A-6270JC-14
Upper level residence bathroom central portion of northeast wall.	DWJC	19A-6270JC-15
Upper level residence bathroom southwest wall above toilet.	DWJC	19A-6270JC-16

MATERIAL LOCATION	MATERIAL DESCRIPTION	SAMPLE ID [1]
Upper level residence SE bedroom east corner wall in closet.	DWJC	19A-6270JC-17
Upper level residence SE bedroom west corner wall.	DWJC	19A-6270JC-18
Upper level residence SE bedroom by doorway.	DWJC	19A-6270JC-19
Upper level residence SW bedroom south corner wall.	DWJC	19A-6270JC-20
Upper level residence SW bedroom west corner wall.	DWJC	19A-6270JC-21
Upper level residence SW bedroom north corner wall.	DWJC	19A-6270JC-22
Upper level top of staircase behind wood siding.	Building Paper	19A-6270JC-23
Upper level side attic.	Roll of Building Paper	19A-6270JC-24
Upper level residence living room ceiling.	Ceiling Texture Coat (CTC)	19A-6270JC-27
Upper level residence SE bedroom ceiling.	CTC	19A-6270JC-28
Upper level residence SW bedroom ceiling.	CTC	19A-6270JC-29
Under level residence under wood plank flooring by side attic entrance.	Flooring Glue	19A-6270JC-30
Under level residence under wood plank flooring by side attic entrance.	Building Paper	19A-6270JC-31
Warehouse northeast wall behind painted plywood panelling and concrete perimeter foundation wall.	Plywood/Foundation Glue	19A-6270JC-32
Warehouse southwest wall behind white hard surface panel sheet and base mount plywood panelling.	Sheet Panel/Plywood Glue	19A-6270JC-33
Southwest portion of Warehouse upper north corner wall.	DWJC	19A-6270JC-34
Southwest portion of Warehouse upper northeast wall – central northwest portion.	DWJC	19A-6270JC-35
Southwest portion of Warehouse upper northeast wall – central southeast portion.	DWJC	19A-6270JC-36
Southwest portion of Warehouse upper east corner wall.	DWJC	19A-6270JC-37

MATERIAL LOCATION	MATERIAL DESCRIPTION	SAMPLE ID [1]
Southwest portion of Warehouse upper southeast wall.	DWJC	19A-6270JC-38
Roof peak attic debris on top of insulation.	Asphalt Shingle	19A-6270JC-39
Roof peak attic roofing coring of former roofing material layerings remaining under metal roof cladding.	Roof Core (4 layers; 2 roofing paper, & 2 asphalt shingle)	19A-6270JC-40
Upper residence bathroom floor.	12" Tan Floor Tile + Mortar + Grout	19A-6270JC-41
Upper residence bathroom tub surround.	6" White Wall Tile + Mortar + Grout	19A-6270JC-42
Warehouse top of northeast perimeter concrete foundation and below wood framing sill plate.	Membrane	19A-6270JC-43
Warehouse northeast wall between outer layer of OSB and exterior wood siding.	Building Paper	19A-6270JC-44
Northeast portion of Warehouse northwest ceiling area.	DWJC	19A-6270JC-45
Northeast portion of Warehouse southeast ceiling area.	DWJC	19A-6270JC-46
Central portion of Warehouse northwest ceiling area.	DWJC	19A-6270JC-47
Central portion of Warehouse central ceiling area.	DWJC	19A-6270JC-48
Central portion of Warehouse southeast ceiling area.	DWJC	19A-6270JC-49
1 Laboratory confirmation of non-asbestos-containing material is provided in the laboratory results Appendix C.		

Based on WSP's professional opinion, the remaining readily accessible building materials as listed at the end of Section 4.2 'Asbestos Survey Methodology' and observed within the Subject Building(s) were assumed not to contain asbestos during this survey and were classified as non-asbestos materials.

6.3 SUSPECTED LEAD-CONTAINING MATERIALS

Lead is expected to be present in the following building components, if present, in the building(s):

- as a surface coating, such as paint;
- in lead acid batteries for emergency lighting;
- as a component in ceramic building products such as tiles and bricks;

- as a component of the solder on sweated joints between copper pipe and fittings;
- as a component of the solder on wire connections of electric components;
- as a component of solder used to seal the bell fitting of cast iron rain water and sanitary drain pipes; and
- as a malleable metal sheeting/flashing around roof edges, vent stacks, HVAC fixtures, etc.

Work that will disrupt or disperse (including drilling, cutting, grinding or abrading) lead-containing materials shall comply with the requirements of the BC Occupational Health and Safety Regulations.

The measures to be applied for work in the presence of lead are determined according to the type of work carried out and the level of exposure of the workers.

Removal and disposal of lead-containing equipment or materials is required prior to any construction or demolition activity that may cause disruption to this equipment or materials. The handling, transport and disposal of lead-containing equipment or materials must comply with all federal lead regulations and directives, including the requirements of R.S.A. 2000, c. E-12 - Environmental Protection and Improvement Act.

6.4 LEAD PAINT

A total of eleven (11) paint samples were collected and analyzed at the time of the survey. The table below summarizes the results of laboratory analyses for the bulk paint (surface coating) samples collected during the survey.

Table 6 Summary of Lead Concentrations in Bulk Paint Samples

MATERIAL DESCRIPTION	ASSESSMENT	ACTION[1]
Cream paint from exterior metal doors.	**Sample ID: 19L-6270JC-01** **Concentration: 0.041 wt% (410 ppm)** **Condition: Good**	If renovation or demolition work is undertaken, workers could be exposed to lead dust in the air or through dermal contact. Special measures including safe work practices, an exposure control plan, work practice risk assessments and/or other controls must be applied in accordance with WorkSafeBC OHSR.
Grey paint from exterior wood trim.	Sample ID: 19L-6270JC -02 Concentration: <0.0058 wt% (<58 ppm) Condition: Fair	No Action Required Results are below laboratory detection limits.
White paint from exterior side of roll-up metal Warehouse door.	Sample ID: 19L-6270JC -03 Concentration: <0.0083 wt% (<83 ppm) Condition: Good	No Action Required Results are below laboratory detection limits.

Green paint from exterior wood siding.	**Sample ID: 19L-6270JC -04** **Concentration: 0.022 wt% (220 ppm)** **Condition: Fair**	If renovation or demolition work is undertaken, workers could be exposed to lead dust in the air or through dermal contact. Special measures including safe work practices, an exposure control plan, work practice risk assessments and/or other controls must be applied in accordance with WorkSafeBC OHSR.
White paint from electrical room wood door.	Sample ID: 19L-6270JC -05 Concentration: <0.0057 wt% (<57 ppm) Condition: Good	No Action Required Results are below laboratory detection limits.
White paint from Warehouse northeast plywood wall.	**Sample ID: 19L-6270JC -06** **Concentration: 0.012 wt% (120 ppm)** **Condition: Good**	If renovation or demolition work is undertaken, workers could be exposed to lead dust in the air or through dermal contact. Special measures including safe work practices, an exposure control plan, work practice risk assessments and/or other controls must be applied in accordance with WorkSafeBC OHSR.
Layered grey paint from Warehouse concrete floor.	**Sample ID: 19L-6270JC -07** **Concentration: 0.011 wt% (110 ppm)** **Condition: Poor**	
Light grey paint from interior side of roll-up metal Warehouse door.	Sample ID: 19L-6270JC -08 Concentration: <0.0084 wt% (<84 ppm) Condition: Good	No Action Required Results are below laboratory detection limits.
Yellow paint from upper residence drywall wall.	Sample ID: 19L-6270JC -09 Concentration: <0.0079 wt% (<79 ppm) Condition: Good	
White paint from upper residence drywall wall.	**Sample ID: 19L-6270JC-10** **Concentration: 0.0086 wt% (86 ppm)** **Condition: Good**	If renovation or demolition work is undertaken, workers could be exposed to lead dust in the air or through dermal contact. Special measures including safe work practices, an exposure control plan, work practice risk assessments and/or other controls must be applied in accordance with WorkSafeBC OHSR.
Off-white paint from upper level residence sub-floor at entrance to side attic.	Sample ID: 19L-6270JC-11 Concentration: <0.0080 wt% (<80 ppm) Condition: Poor	No Action Required Results are below laboratory detection limits.
1 For sample ID and concentration levels refer to Appendix C: Certificates of Analysis – Lead.		

Emergency light fixtures with potentially associated lead batteries in the casements were not observed within the Subject Building(s).

Lead may be a component of the solder on wire connections of electric components and on sweated joints between copper pipes and fittings in the building.

Asbestos and/or lead packing may be present in the bell housings of the cast iron drain systems if present on site.

6.5 TCLP RESULTS FOR LEAD

WSP collected bulk samples of non-metallic based substrates with surface coatings suspected to potentially exceed the BC Ministry of Environment Hazardous Waste Criteria of 5.0 mg/L for Lead.

The selected non-metallic bulk substrate materials were those identified with lead containing paint concentrations in excess of 100 mg/kg and anticipated to potentially be transferred for disposal as part of the planned demolition for the site.

For identification purposes the last two (2) digits in the TCLP sample identification numbers of the base substrates with paint were kept the same as the last two (2) digits in the associated surface coating (paint) identification numbers (i.e., sample ID # 6270JC-TCLP02 is the same paint as 19L-6270JC-02 in Table 6 as are those ending in -04, -06, -07, -09 & -10). The results of the TCLP analysis for lead, by iATL, are tabulated below.

Table 7 Suspect Lead Based Paint TCLP Results

SAMPLE LOCATION	MATERIAL SAMPLED	SAMPLE ID	LEACHATE RESULT [PB (MG/L)]
Northwest Exterior Siding	Grey Paint on Wood Trim **Lead Concentration: 0.014 wt% (140 ppm)**	6270JC-TCLP02	<0.20
Northwest Exterior Siding	Green Paint on Wood Siding **Lead Concentration: 0.011 wt% (110 ppm)**	6270JC-TCLP04	<0.20
Warehouse Northeast Wall	White Paint on Plywood Lead Concentration: <0.0035 wt% (<35 ppm)	6270JC-TCLP06	NA
By Warehouse Entry Door	Grey Paint on Concrete Lead Concentration: <0.0029 wt% (<29 ppm)	6270JC-TCLP07	NA
Upper Residence Northwest Wall	Yellow Paint on Drywall Lead Concentration: <0.0039 wt% (<39 ppm)	6270JC-TCLP09	NA

SAMPLE LOCATION	MATERIAL SAMPLED	SAMPLE ID	LEACHATE RESULT [PB (MG/L)]
Upper Residence Southeast Wall	White Paint on Plywood Lead Concentration: <0.0034 wt% (<34 ppm)	6270JC-TCLP10	NA

Notes: NA - Samples containing less than (<) 100 mg/kg Total Lead do not require TCLP analysis (Ref. 1311 Sec 1.2).

The TCLP samples were analyzed by International Asbestos Testing Laboratories (iATL) following the Toxicity Characteristic Leaching Procedure (TCLP). The samples were analyzed in accordance with EPA Method 6020A Metals by TCLP.

This method complies with the Hazardous Waste Regulation as defined by the BC Ministry of Environment. The total allowable concentration in waste extract for lead as defined in the Hazardous Waste Regulation is < 5 mg/L.

The sample results for all selected paint samples analyzed (tabulated above) are below the BC Ministry of Environment Special Waste criteria of 5 mg/L and therefore may be disposed of as non-hazardous waste.

The completed Chain-of-Custody (COCs) forms and the Laboratory Reports of analytical results are presented in Appendix III.

6.6 OTHER DESIGNATED SUBSTANCES AND HAZARDOUS MATERIALS

The following table summarizes other designated substances and hazardous materials which were also included in the survey. Identification of these materials and substances were based on visual observations only, and where appropriate, recommendations and necessary actions have been provided.

Designated substances and hazardous material must be handled in accordance with the appropriate guidelines and regulations. Designated substance and hazardous material information will require updating as corrective measures are instituted and materials have been removed from various sections of the Subject Building(s).

Table 8 Other Designated Substances and Hazardous Materials included in the Survey

MATERIAL	DESCRIPTION	FINDINGS	ACTION
Mercury	Mercury is used in thermometers, batteries and some electrical switches. It is also used in latex paint to protect against fungal attack and mildew. Mercury vapour is also present as a vapour in fluorescent lights, metal halide lights and mercury vapour lights.	Older style mercury filled glass activator switch bulb thermostatic controls were not observed to be present in the Subject Building. An exterior area flood lamp fixture was observed to be mounted at the peak of the northwest wall. The lamp is assumed to contain bulb(s) that are anticipated to be either metal halide or high-pressure sodium bulbs. Metal halide and high-pressure sodium bulbs typically contain mercury and/or other heavy metals. Fluorescent light style fixtures were observed throughout the Subject Building (warehouse, electrical room, and residence kitchen). Although no samples were analyzed for mercury, it is presumed to be present in the following building components: • as a gas in fluorescent lights (compacts or tubes).	The presence of mercury within assembled units (e.g. metal halide bulbs and/or high-pressure sodium bulbs, fluorescent light compacts/tubes, and thermostat glass activator bulbs) should not be considered a hazard provided that the assembled units remain sealed and intact. Avoid direct skin contact with mercury and avoid inhalation of mercury vapour. Removal and disposal of mercury-containing equipment is required prior to renovation or demolition activities that may disturb this equipment. The handling, transportation and disposal of mercury-containing equipment must comply with all provincial and federal regulations and guidelines for mercury.

MATERIAL	DESCRIPTION	FINDINGS	ACTION
Arsenic	Arsenic is used with other metals (chiefly copper, lead and zinc) to make alloys. Arsenic compounds are also used in pigments, animal poisons, insecticides, paints, wallpaper, ceramics, glass making, integrated circuits and transistors.	Rodent traps and broadcast loose green coloured material (potentially poison) was observed in the electrical room as well as along the perimeter walls within the warehouse and adjacent washrooms and common room. Rodent traps were observed in the side attic.	Rodent traps and the broadcast loose green coloured material (potentially poison) should be assessed for potential presence of arsenic/rodent poison and/or be amended or remediated on site by a professional pest control service operator in order to limit potential exposure during normal occupancy access or during demolition process works.
Polychlorinated Biphenyls (PCBs)	The federal Regulation SOR/2008-273 (September 5, 2008) states that any solid material containing 50 parts per million (ppm) or more of PCBs must be handled as a PCB-containing material in accordance with all applicable regulations.	Fluorescent light style fixtures were observed within the upper residence kitchen, Warehouse and the east electrical room. A representative number of the associated light ballast(s) in the Warehouse were examined to determine the presence/absence of PCBs and were found to not contain PCBs. The survey did not include inspection within the electrical equipment (transformers, electrical panels, and hot water heater). These pieces of electrical equipment were considered inaccessible to the surveyors as they were energized at the time of the site visit. As such, the electrical equipment are suspected to potentially contain PCB-containing material.	A professional certified electrician should confirm the potential presence of PCBs in ballasts, transformers and capacitors present on site. When decommissioning ballasts that were built prior to July 1, 1980 and that do not have a “No PCBs” indicator on the label, manufacturer’s codes should be compared with Environment Canada’s Identification of Lamp Ballasts Containing PCBs EPS 2/CC/2 (revised). Handle, store and dispose of PCB-containing materials in accordance with *Federal PCB Regulation SOR/92-507*

MATERIAL	DESCRIPTION	FINDINGS	ACTION
Crystalline Silica	Silica, or silicon dioxide (SiO_2), is the basic component of sand, quartz and granite rock. Crystalline Silica (the designated substance) is encountered in industry in three forms: quartz, tridymite, and cristobalite.	Crystalline Silica should be assumed to be present in glass, concrete cement foundation, concrete cement lower level floor slab, ceramic tiles, and exterior concrete cement parking slab. Crystalline Silica should be assumed to be present as a minor component in drywall.	Work that may disturb silica-containing materials should follow all applicable provincial and federal regulations and guidelines pertaining to Silica.
Ozone Depleting Substances (ODSs)	It is the intention of the federal government to phase out the use of ODSs by the year 2030. The Ozone-depleting Substances and Halocarbon Alternatives Regulations (ODSHAR) repealed and replaced Canada's Ozone-depleting Substances Regulations, 1998 on December 29, 2016 and are the means by which Canada meets its obligations under the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol).	There is a domestic style refrigerator in the upper residence kitchen. This appliance is suspected to potentially contain ODS.	Decommissioning, removal and disposal of any equipment suspected, or confirmed, to contain ODS must comply with provincial (BC Ozone Depleting Substances and Other Halocarbons Regulation 386/99) and federal regulations pertaining to ODS including: Federal (FHR 2003) and General Waste Management Regulations (R.R.O. 1990, Regulation 347).

MATERIAL	DESCRIPTION	FINDINGS	ACTION
Radioactive Materials (RAMs)	Smoke/heat detectors may contain a radioactive power source. Atomic Energy Control Board (AECB) guidelines state that smoke detectors containing more than 5 µCi of Am-241 or any amount of Radium -226 must be disposed of through a consultant or AECB licensed waste facility. The current AECB guidelines allow for the disposal of smoke detectors with an Am-241 isotope source of less than 5.0 µCi to a regular landfill site.	Smoke/heat detectors were observed on the ceilings of the lower level of the building and appeared to have been removed from the upper residence.	Smoke detectors or other equipment with RAM should be recycled when removed from service. AlarmRecycle is a recycling program for used or expired smoke and carbon monoxide (CO) alarms. Since October 1, 2011, BC residents have been able to drop off their smoke and CO alarms for recycling at AlarmRecycle drop-off locations across BC. Smoke detectors must be disposed of in packages containing a maximum of ten smoke detectors per package.
Radon	Radon is a colourless, odourless, and tasteless radioactive gas formed from the breakdown of uranium, a naturally occurring radioactive material found in soil, rock, and groundwater. Radon concentrations will vary depending on underlying geologic units, uranium geochemistry and radiometric geophysical response. As a gas, radon can move freely from the soil or bedrock into the atmosphere, and may accumulate in enclosed areas, such as buildings.	Review of the Radon Potential Map Canada (REM Corp., 2012) could not readily confirm the location of the Subject Property in relation to the variously depicted Relative Radon Hazard Zones of the surrounding area. There is a potential for the subject property to be located in an area attributed as potentially having Relatively High Radon Hazard.	Radon testing should be undertaken and the results compared to the current Canadian guideline for radon in indoor air for Buildings which is 200 becquerels per cubic metre (200 Bq/m^3). This guideline provides Canadians with guidance on when to take remedial action to reduce radon levels.

MATERIAL	DESCRIPTION	FINDINGS	ACTION
Mould	Mould is a group of various species of simple, microscopic organisms found in every ecological niche, indoors and outdoors. Moulds are necessary for recycling of organic materials in nature. To grow, mould needs: — A mould spore; — An organic food source (i.e. paper, drywall, wood, dirt, paint, etc.); — Moisture; — Time (this will vary depending on the site-specific conditions, including the cleanliness of the water source).	At the time of the subject DSS site review (December 18th, 2019) olfactory senses of the WSP field reviewer did not detect nor did the reviewer receive reports of incidences of the sensory presence of musty odours or smells from within the lower or upper occupancy levels of the building. Visual examination at the time of the DSS subject site review found: • Mould spotting (approximately 1m^2) in the west corner of the warehouse on the drywall of the lower portion of the sloping ceiling. • Water damage on the underside of the plywood ceiling in the electrical room. • Water damage behind the ceramic tile tub surround in the upper residence bathroom.	Demolition contractors should be warned of the presence of mould and every precaution should be taken to prevent airborne exposure to workers where mould is present and where workers are likely to inhale or ingest mould. Annual review for further mould growth should be assessed with regards to potential moisture buildup, and condensation that could contribute to mould growth. The BC OHSR requires regular inspection of ventilation systems for conditions that could promote the growth of micro-organisms.

MATERIAL	DESCRIPTION	FINDINGS	ACTION
Microbial Contaminants	Cross species potentially transmittable infectious diseases: (zoonotic transmission) are associated with rodents/bats and droppings. Pathogenic potential has been confirmed for bats including: • Bacterial pathogens (Pasteurella, Salmonella, Escherichia, Yersinia spp, Bartonella, Borrelia and Leptospira spp) • Rabies (typically attributed to mammalian carriers). • Hanta viruses (typically attributed/identified in rodents). Histoplasmosis (primarily sourced from bird/avian droppings).	Rodent droppings were observed on the floor of the electrical room. Very few (limited) rodent droppings were observed on top of the access hatch leading to the roof peak attic space. Rodent traps and green coloured poison were observed in the electrical room as well as along the perimeter walls within the warehouse and adjacent washrooms and common room. Rodent traps were observed in the side attic.	Personal protective equipment should be worn when entering areas with rodent droppings and or poisons. Consult professional services to identify and thereafter abate the affected area.
Wasp Nest	Miscellaneous materials not mentioned above include substances that can cause harm to people, organisms, property or the environment.	A wasp nest was observed on the interior wood framing above the doorway of the electrical room.	Wasp nests found during winter or early spring are old nests from the previous summer. They are considered to have no live wasps in the nest where they have already left or died inside it. An over wintered nest can be safely removed and disposed of if desired.

MATERIAL	DESCRIPTION	FINDINGS	ACTION
Flammable, Volatile, Explosive, or Potentially Toxic/Hazardous Materials (creosote, fuels and lubricants)	Propane is widely used as a fuel for heating appliances. It can be a hazard when it is released into the atmosphere and comes in contact with an ignition source that causes it to ignite and burn or explode if in a confined area. Propane is heavier than air and can displace normal air which can allow pockets of propane gas to from at low points on the ground or inside a building. Fuels and lubricants comprised of Benzene, Ethylbenzene, Toluene, Xylene (BTEX) and other hydro-carbons are widely used in motorized and mechanical equipment. BTEX is highly volatile, and will release into the atmosphere over a short time.	Commonly associated power equipment use quantities of lubricants are anticipated to be stored on site. A 20 litre container of unknown contents was observed in the ground level storage shed with the former water pump manifold (assumed marine) attached approximately midway along the southwest side of the building. Three (3) smaller containers, two 4 litre containers of unknown contents and one 1 litre container marked muriatic acid, were observed in the ground level storage room under the access staircase.	The storage requirements for common domestic quantities of fuels, lubricants, paints, and propane should reviewed. Undetermined container contents should be assumed to contain hazardous chemicals and be disposed of by a professional abatement contractor prior to demolition of the building(s).

7 LIMITATIONS

The field observations and laboratory analyses presented herein are considered sufficient in detail and scope to form a general record of designated substances at the Subject Property Building(s). The findings and conclusions contained herein have been prepared in accordance with generally accepted industry standards and procedures. It is possible that designated substances or hazardous materials may exist which could not be reasonably identified within the scope of the assessment or which were not apparent during the site visit. WSP Canada Inc. cannot warrant or guarantee that the information presented in this report is absolutely complete or accurate beyond those observations and findings reported herein.

This report is prepared for the sole use of Department of Fisheries and Oceans, who are responsible for its distribution to any third parties. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third party. The conclusions and recommendations contained in this assessment report are based upon professional opinions with regard to the subject matter. These opinions are in accordance with currently accepted industry practices for asbestos surveys and regulatory requirements for sampling and identifying asbestos and are subject to the following inherent limitations:

- The data and findings presented in this report are valid as of the date(s) of the investigation only. The passage of time, manifestation of latent conditions or occurrence of future events may warrant further exploration of the Subject Property Building(s), analysis of the data, and re-evaluation of the findings, observations, and conclusions expressed in this report.
- The findings, observations, conclusions, and recommendations expressed by WSP Canada Inc. in this report do not represent an opinion concerning compliance of any past or present owner or operator of the Subject Property Building(s) with any federal, provincial or local laws or regulations.
- WSP's assessment presents professional opinions and findings of a scientific and technical nature. While attempts were made to relate the data and findings to applicable environmental and occupational health & safety laws and regulations, the report shall not be construed to offer legal opinion or representations as to the requirements of, nor compliance with, environmental and occupational health and safety laws, rules, regulations or policies of federal, provincial, or local governmental agencies. WSP Canada Inc., liability extends only to its client and not to other parties who may obtain this assessment report.
- This DSS included accessible interior and exterior building construction materials and components only. Below grade materials were specifically excluded from the scope of this investigation. Only those areas deemed accessible were sampled. As it is neither practical nor feasible to sample materials on a foot by foot basis, visually similar materials' analysis results were extrapolated throughout the client designated areas of the structure and / or based on estimated phases of construction, where that information was made available.
- Energised electrical and mechanical equipment or systems were not opened for safety reasons. This survey excluded owner or occupant articles such as furniture or stored items. Concealed or inaccessible materials within the building structure and below-ground materials including tanks and pipes were specifically excluded from our scope of work.
- No below-grade water, drainage or plumbing systems, or sub surface investigations of materials were included in the scope of this DSS.

8 RECOMMENDATIONS

Based on our review of building materials, and the laboratory results, WSP has the following recommendations:

- All asbestos-containing materials must be removed using safe work practices and procedures prior to demolition activities. The WorkSafeBC publication "Safe Work Practices for Handling Asbestos" and the Occupational Health and Safety (OHS) Guideline G6.8 describes acceptable practices;
- If cast iron drain systems are encountered, asbestos and/or lead packing may be present in the bell housings of the cast iron drain systems on site;
- A risk assessment for asbestos-containing materials must be performed prior to renovation or demolition work beginning to determine the exposure risk to workers and other persons as per OHS Guideline G20.112;
- If vermiculite insulation is encountered within the wall or ceiling cavities it is considered a highly friable asbestos-containing material that can be disturbed during wall/ceiling alteration or modification activities. Site specific safe work procedures should be implemented in conjunction with any planned wall/ ceiling/ attic alterations or modifications;
- WSP should be notified if any suspect asbestos-containing material or hazardous materials not identified in this report are exposed or encountered during renovation of demolition of the survey buildings. Suspect materials should be considered hazardous pending further review;
- Maintain and update the asbestos management plan and labelling program to reflect material changes to ACMs managed in place, as per WorkSafeBC occupational health and safety regulation 6.5, identification. All ACM in the building should continue to be inspected annually for evidence of damage or deterioration of integrity and the inventory updated;
- Proper procedures and documentation such as safe work practices, an exposure control plan, risk assessments and/or other controls must be developed to mitigate the risk of exposure to lead for all workers. When evaluating risk, the concentration of lead in paint and the activity must be considered together. If a surface coating is encountered during renovation activities that has not been tested it should be considered lead containing until sample analysis demonstrates otherwise;
- Silica-containing materials were identified at the site. Proper procedures and documentation such as safe work practices, an exposure control plan, risk assessments and/or other controls must be developed for all workers prior to any demolition activities involving the concrete foundation, concrete floor slab, concrete walls, ceramic tiles/grout/mortar, brick/block walls and associated mortar (blocks and mortar) of the subject building;
- Prior to demolition, all light ballasts should be checked for PCB content prior to disposal;
- Fluorescent light tubes and PCB ballasts should be recycled when removed from service. The Light Recycle website provides a list of recycling facilities on their website, at http://www.lightrecycle.ca/;
- Prior to renovation or demolition all mercury containing devices, fluorescent light tubes, compact fluorescents, and metal halide bulbs and/or high-pressure sodium bulbs containing mercury and/or heavy metals should be recycled when removed from service. Consult the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI) Thermostat Recovery Program (TRP) for return/recycling locations (https://www.hrai.ca/public-drop-off-locations) associated with this stewardship program focused on recovering and recycling thermostats that are no longer in use.
- Safe work procedures should be followed when working in proximity to or when removing mould-contaminated materials and animal waste (e.g. rodent droppings).

- All rodent traps and green coloured poison must be removed from the building using safe work practices and procedures prior to undertaking demolition activities. Rodent traps and loose green coloured poison were observed in the electrical room as well as along the perimeter walls within the warehouse and adjacent washrooms and common room. Rodent traps were observed in the side attic.
- All containers of chemicals (known and unknown contents) must be removed from the building using safe work practices and procedures prior to undertaking demolition activities. Remove as a hazardous chemical, the 20 litre container of unknown contents as observed in the ground level storage shed of with former water pump manifold attached approximately midway along the southwest side of the building. Remove the three (3) smaller containers as hazardous chemicals, including two 4 litre containers of unknown contents and one 1 litre container marked muriatic acid as observed in the ground level storage room under the access staircase.
- Ensure any Contractors hired to work on or near asbestos-containing materials have reviewed available surveyed material results, have all documents, procedures, training and other responsibilities completed and in place prior to commencement of work.
- Retain a copy of this report and provide it to any contractors who may be undertaking demolition work in the building as required by Section 20.112 of the WorkSafeBC regulations; and
- Following completion of the hazardous materials removal an inspection must be conducted by a Qualified Person to confirm that the hazardous materials have all been removed and an inspection report confirming the removal must be posted on site prior to demolition, restoration, or renovation.

9 REFERENCES

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- BC Environmental Management Act SBC 2003, c53 (including amendments to October 30, 2017).
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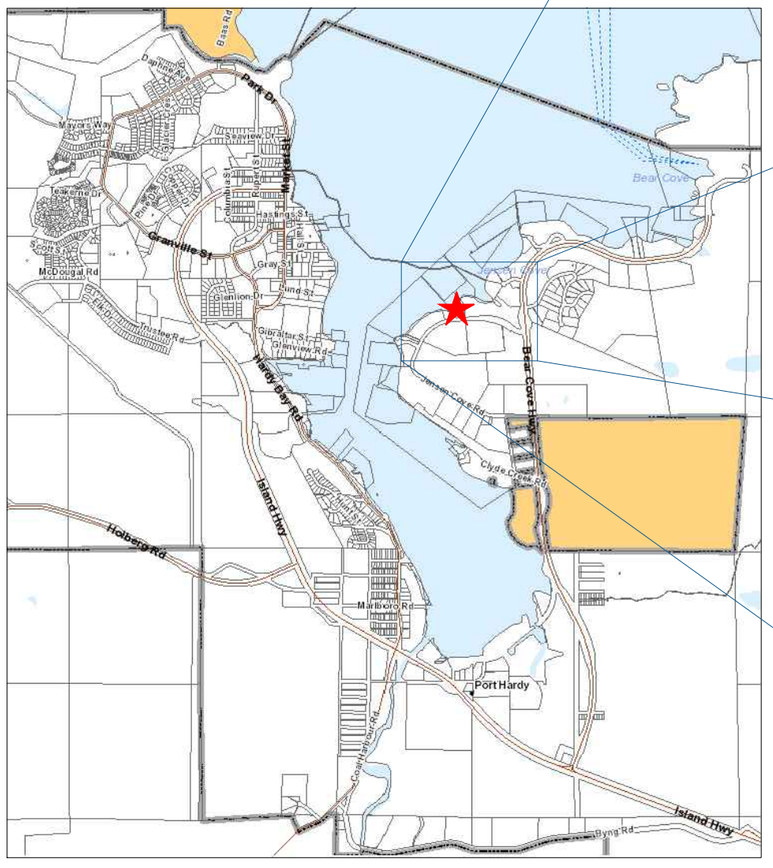
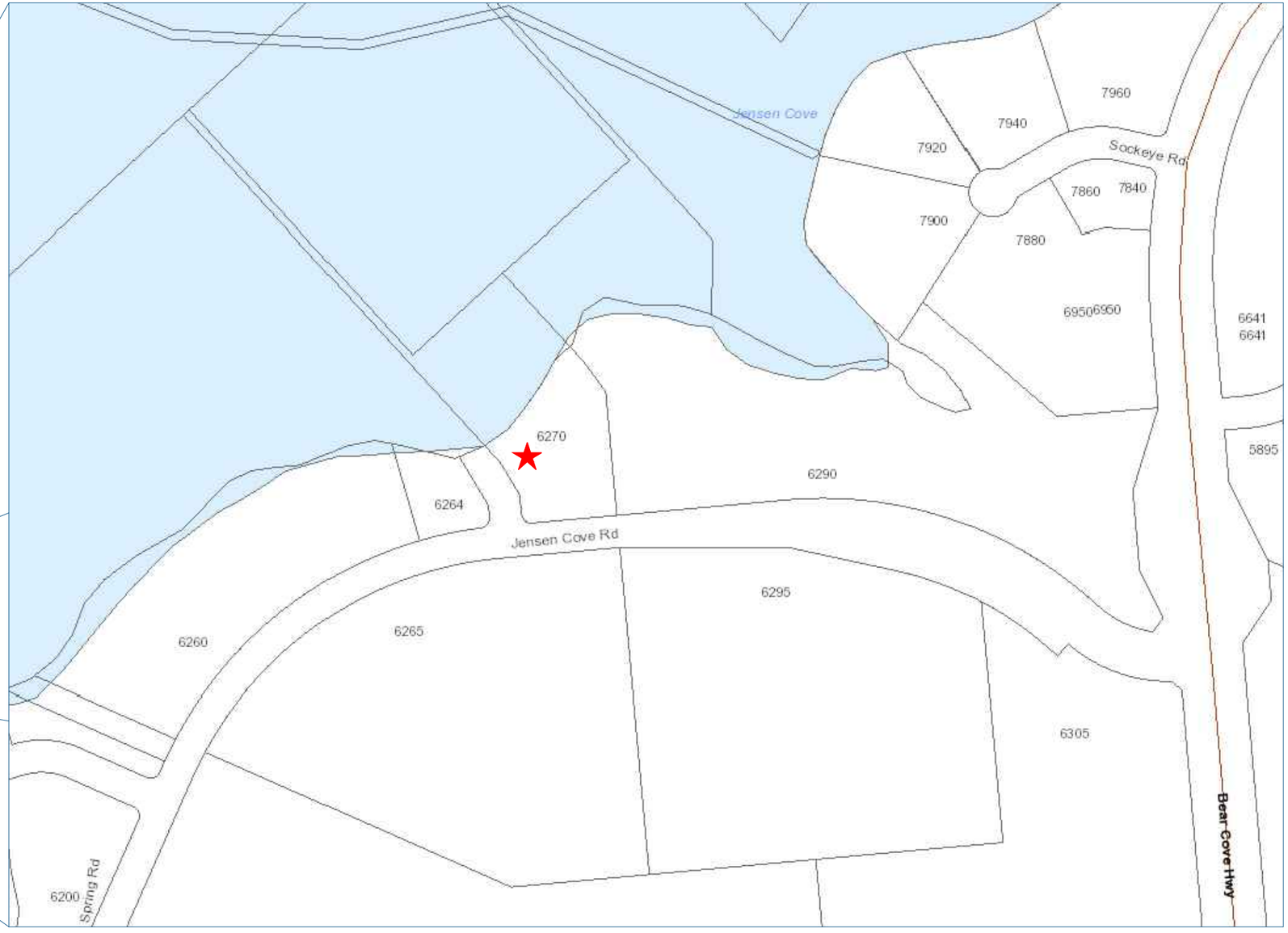
- WorkSafeBC (June 2011). *Lead-Containing Paint and Coatings, Preventing Exposure in the Construction Industry*.
- WorkSafeBC (April 2017). *Safe Work Practices for Handling Asbestos*.
- WorkSafeBC (2017). *Safe Work Practices for Handling Lead*.

APPENDIX

A FIGURES





LEGEND

Subject Site Building Location - ★

For Reference Only

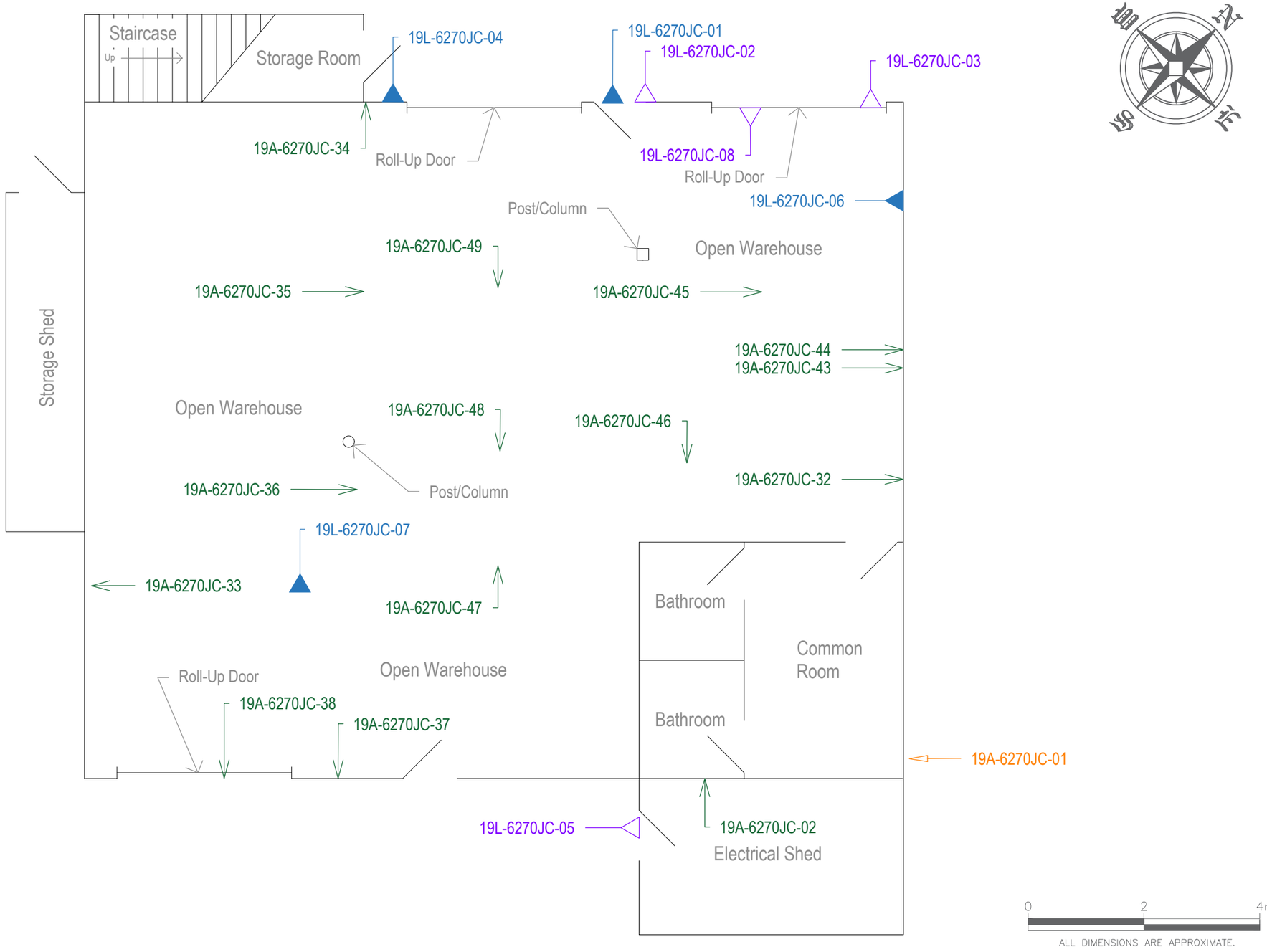
WSP Canada Inc.
Victoria, BC V8Z 6R4
Tell +1-250-475-1000
www.wspgroup.com

TITLE: Site Location Plan

PROJECT: Designated Substances Survey
6270 Jensen Cove Road, Port Hardy, BC

CLIENT: Department of Fisheries and Oceans

DES.	DR. GP
CH.	SCALE NTS
APP.	DATE Jan 2020
FILE NO. 191-14959-00	PHASE NO. 01
DWG. NO. FIGURE 1	



LEGEND

For Reference Only

- ASBESTOS SAMPLE determined "NONE DETECTED"
- ASBESTOS SAMPLE asbestos detected but below WorkSafeBC 0.5% criteria
- ASBESTOS SAMPLE determined to be ASBESTOS CONTAINING "CHRYSOTILE"
- LEAD SAMPLE lead (Pb) content less than Laboratory method detection limit.
- LEAD SAMPLE lead (Pb) content determined by Laboratory which WorkSafeBC considers as a lead-containing surface coating requiring a risk assessment and an exposure control plan.

WSP Canada Inc.
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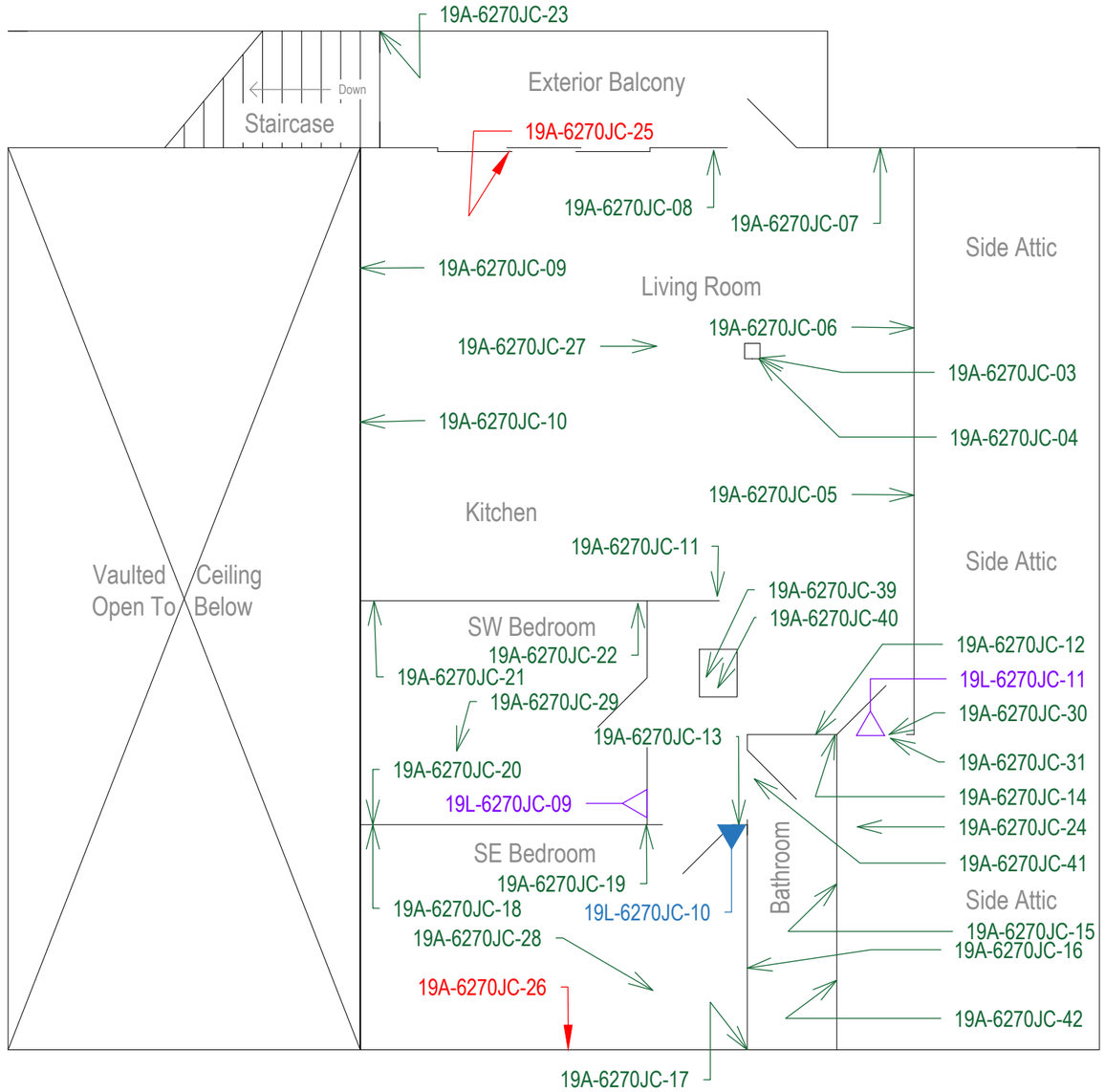
www.wspgroup.com

TITLE: Site Sample Location Plan - Lower Level

PROJECT: Designated Substances Survey
6270 Jensen Cove Road, Port Hardy, BC

CLIENT: Department of Fisheries and Oceans

DES.	DR. GP
CH.	SCALE NTS
APP.	DATE Jan 2020
FILE NO. 191-14959-00	PHASE NO. 01
DWG. NO. FIGURE 2	



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ALL DIMENSIONS ARE APPROXIMATE.

LEGEND

For Reference Only

- ASBESTOS SAMPLE determined "NONE DETECTED"
- ASBESTOS SAMPLE asbestos detected but below WorkSafeBC 0.5% criteria
- ASBESTOS SAMPLE determined to be ASBESTOS CONTAINING "CHRYSOTILE"
- LEAD SAMPLE lead (Pb) content less than Laboratory method detection limit.
- LEAD SAMPLE lead (Pb) content determined by Laboratory which WorkSafeBC considers as a lead-containing surface coating requiring a risk assessment and an exposure control plan.

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TITLE: Site Sample Location Plan - Upper Level
Designated Substances Survey

PROJECT: 6270 Jensen Cove Road, Port Hardy, BC

CLIENT: Department of Fisheries and Oceans

DES.	DR. GP
CH.	SCALE NTS
APP.	DATE Jan 2020
FILE NO. 191-14959-00	PHASE NO. 01
DWG. NO. FIGURE 3	

APPENDIX

B SITE PHOTOGRAPHS

The Subject Site looking southeast (top left), southwest (top right), northwest (bottom left) and north (bottom right).

Warehouse exterior roll-up doors looking east (top left). Warehouse northwest portion looking northeast (top centre). Warehouse southeast-central portion looking east (top right). Warehouse south portion looking south (bottom left). Entrance to lower level Men's washroom (bottom centre) and Women's washroom interior (bottom right).

Electrical Shed/Room attached to the east extent of the southeast elevation of the building (top left) and interior with transformers (top centre & right).

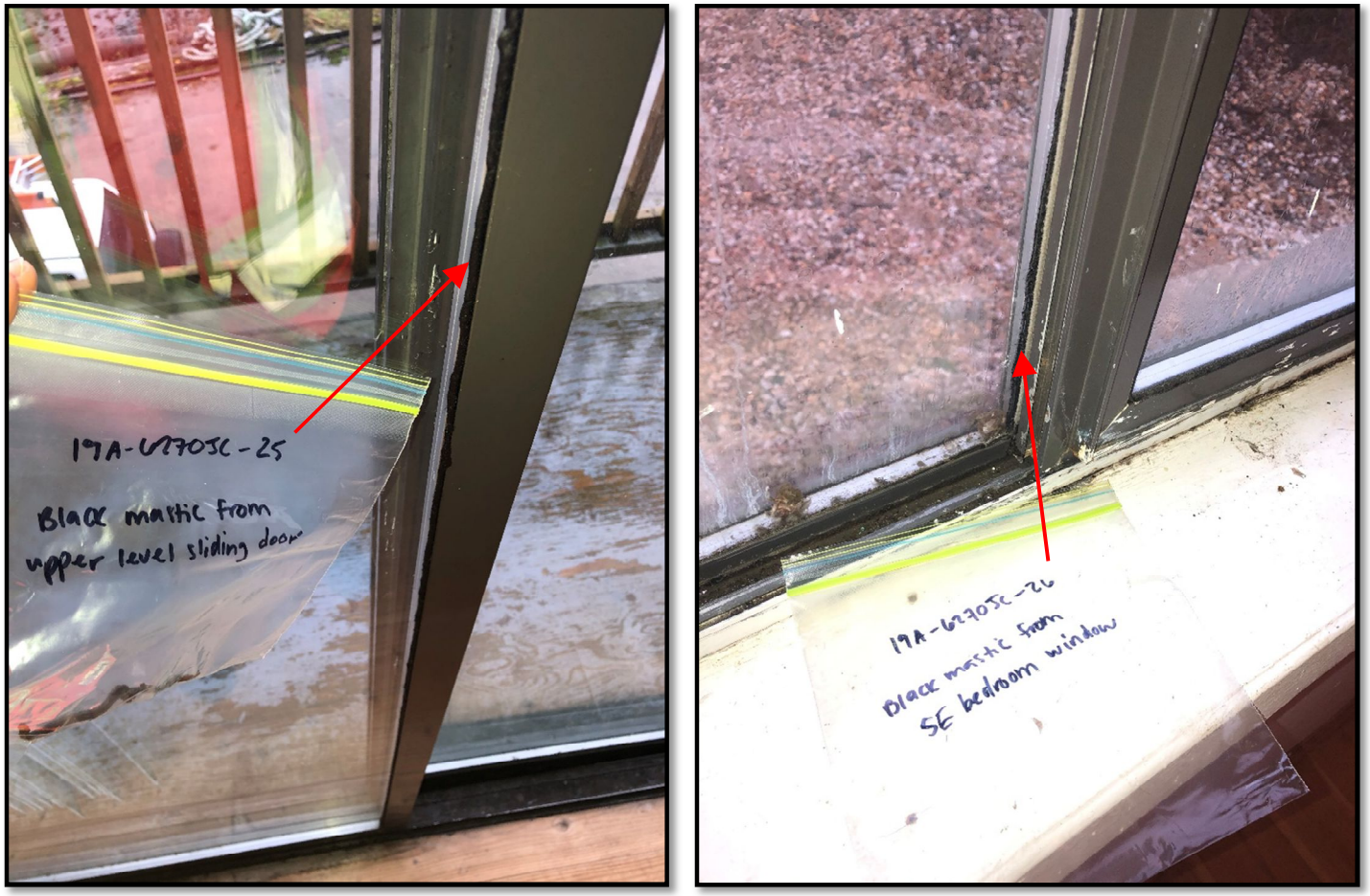
Storage shed interior (bottom left) as attached to the southwest elevation and southeast roll-up door looking northeast (bottom right).

Upper residence living room (top left), kitchen (top centre), laundry with east attic access (top right), bathroom (bottom left) and SE bedroom (bottom right).

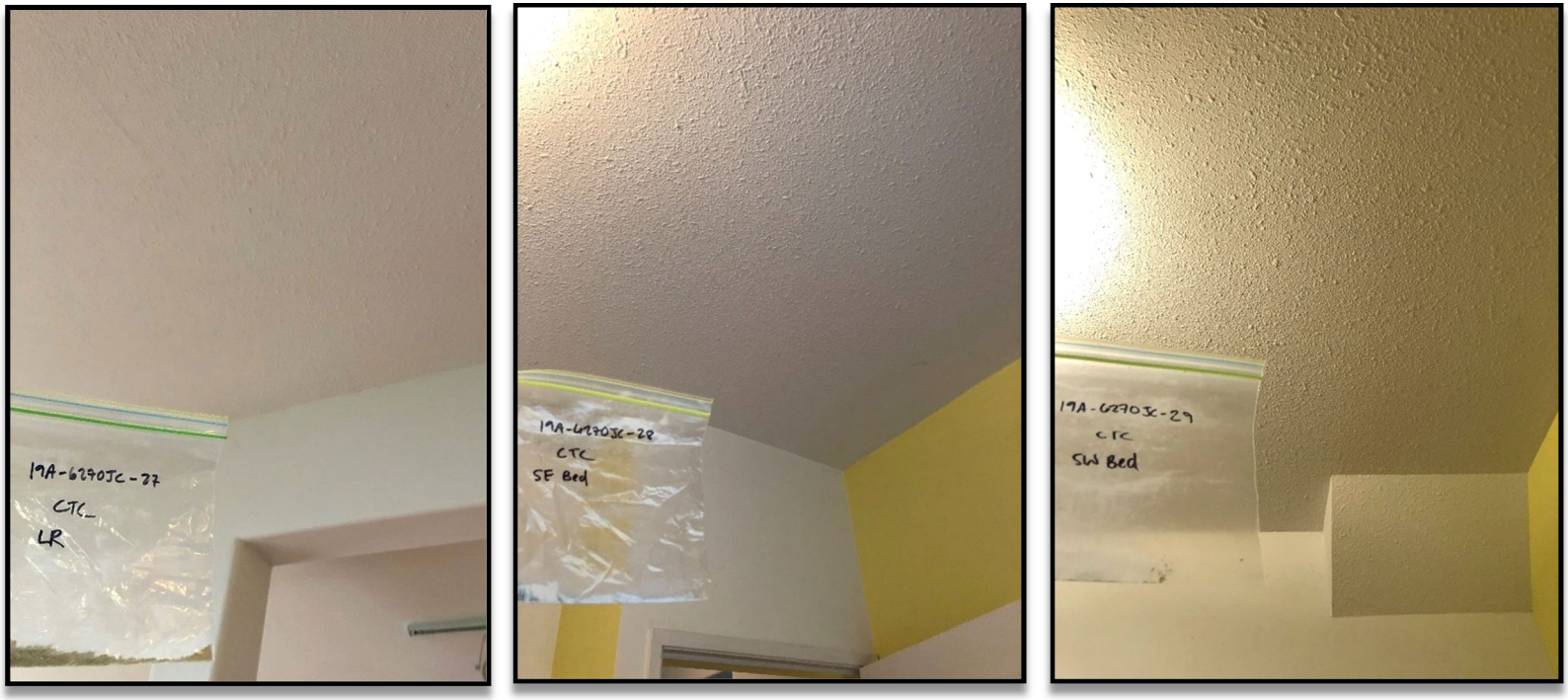
Sample 19A-6270JC-01 black mastic on exterior perimeter foundation (PC 0.25% Chrysotile) (left).

Sample 19A-6270-JC-02 building paper off back of building from within east electrical room was 'None Detected' for asbestos (right).

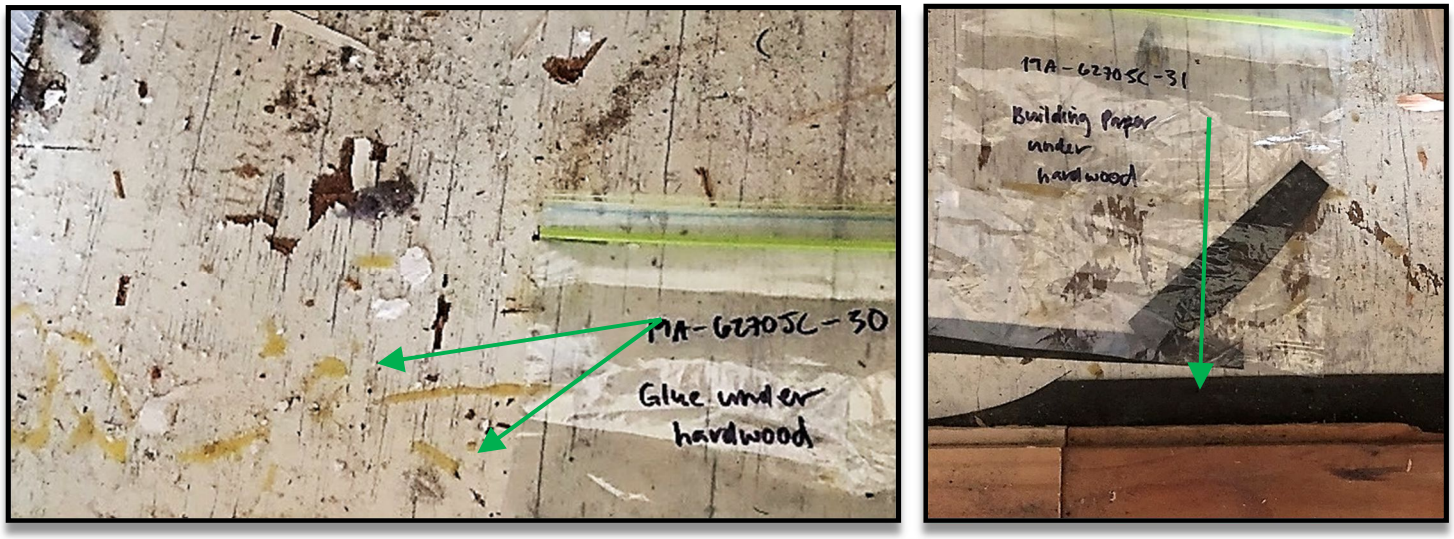
Sample 19A-6270JC-23 of building paper from the upper level top of staircase behind wood siding was 'None Detected' for asbestos (left).
Sample 19A-6270-JC-24 stored roll of building paper within the side attic was 'None Detected' for asbestos (right).



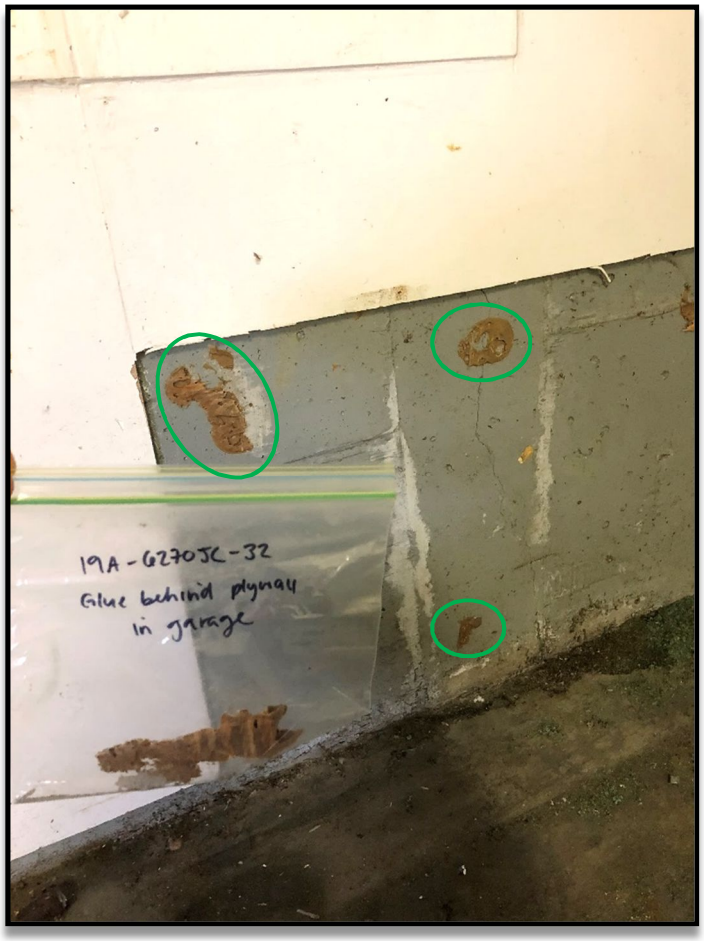
Sample 19A-6270JC-25 black mastic from upper residence sliding door (PC 1.3% Chrysotile) (left).
Sample 19A-6270-JC-26 black mastic from SE bedroom window (PC 1.2% Chrysotile) (right).

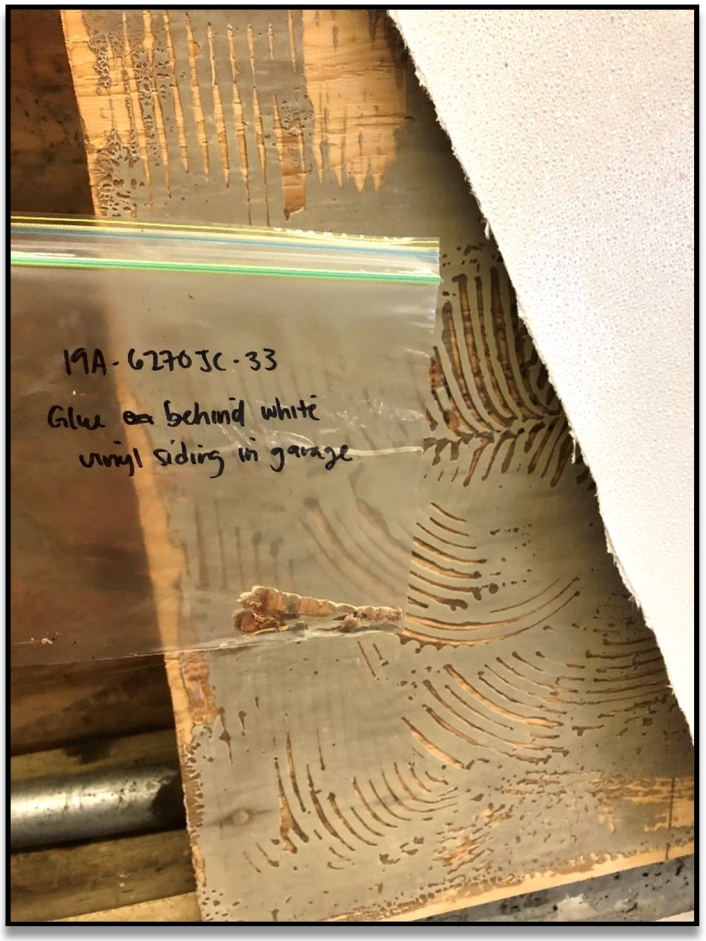


Sample 19A-6270JC-27 ceiling texture coating in the living room was 'None Detected' for asbestos (left).
Sample 19A-6270-JC-28 ceiling texture coating in the SE bedroom was 'None Detected' for asbestos (centre).
Sample 19A-6270-JC-29 ceiling texture coating in the SW bedroom was 'None Detected' for asbestos (right).



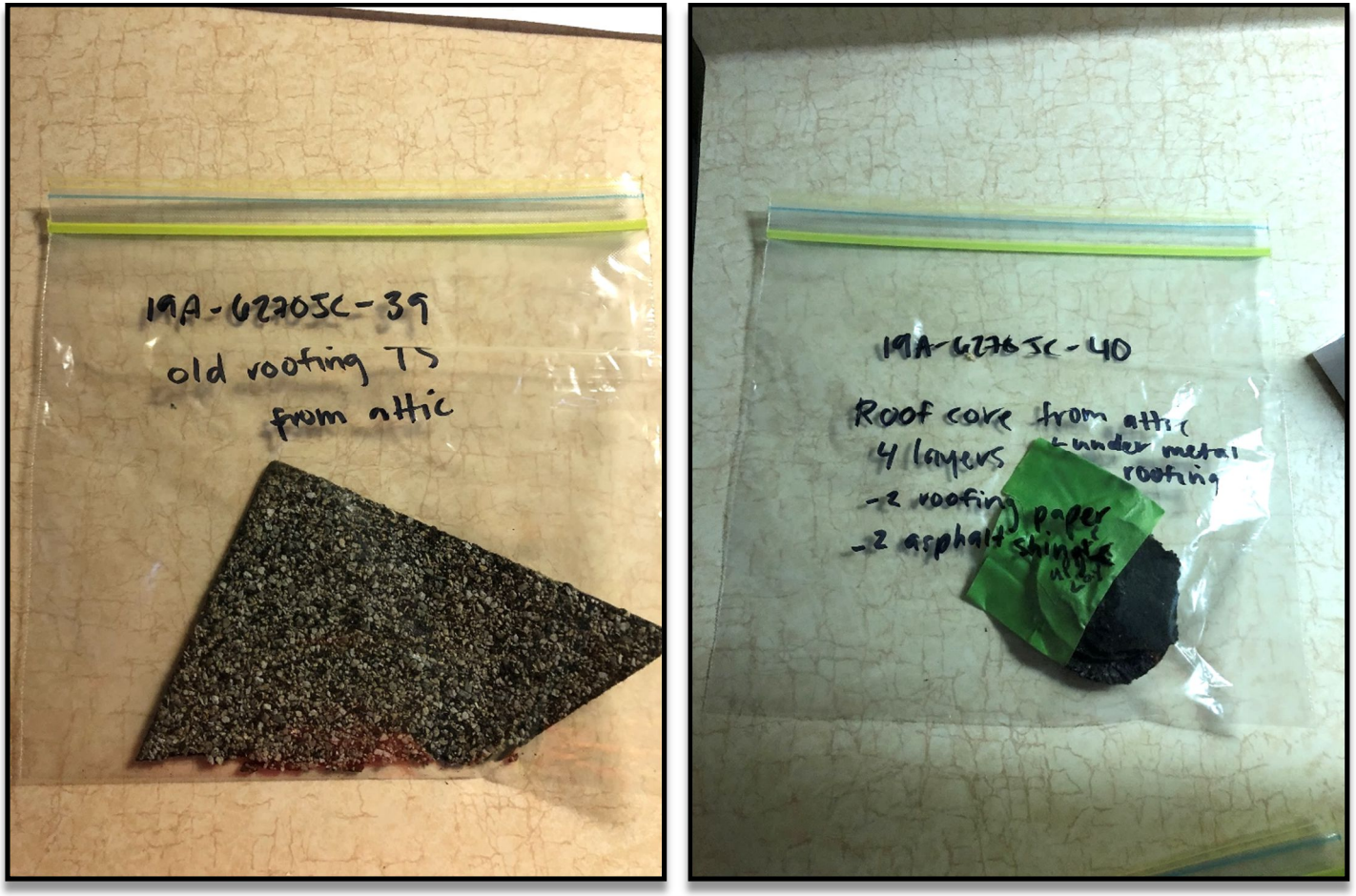
Sample 19A-6270-JC-30 glue on the subfloor under plank flooring at the entrance to the side attic was 'None Detected' for asbestos (left).
Sample 19A-6270-JC-31 building paper under plank flooring at the entrance to the side attic was 'None Detected' for asbestos (right).





Sample 19A-6270-JC-32 glue between plywood panelling and concrete perimeter foundation on the northeast wall of the warehouse was 'None Detected' for asbestos (left).

Sample 19A-6270-JC-33 glue behind white hard surface panel sheet and base mount plywood panelling on the southwest wall of the warehouse was 'None Detected' for asbestos (right).



Sample 19A-6270-JC-39 asphalt shingle roof peak attic debris on top of insulation was 'None Detected' for asbestos (left).
Sample 19A-6270-JC-40 roof peak attic roofing coring of former roofing material layerings remaining under metal roof cladding (2 layers of roofing paper, 2 layers of asphalt shingle) was 'None Detected' for asbestos (right).

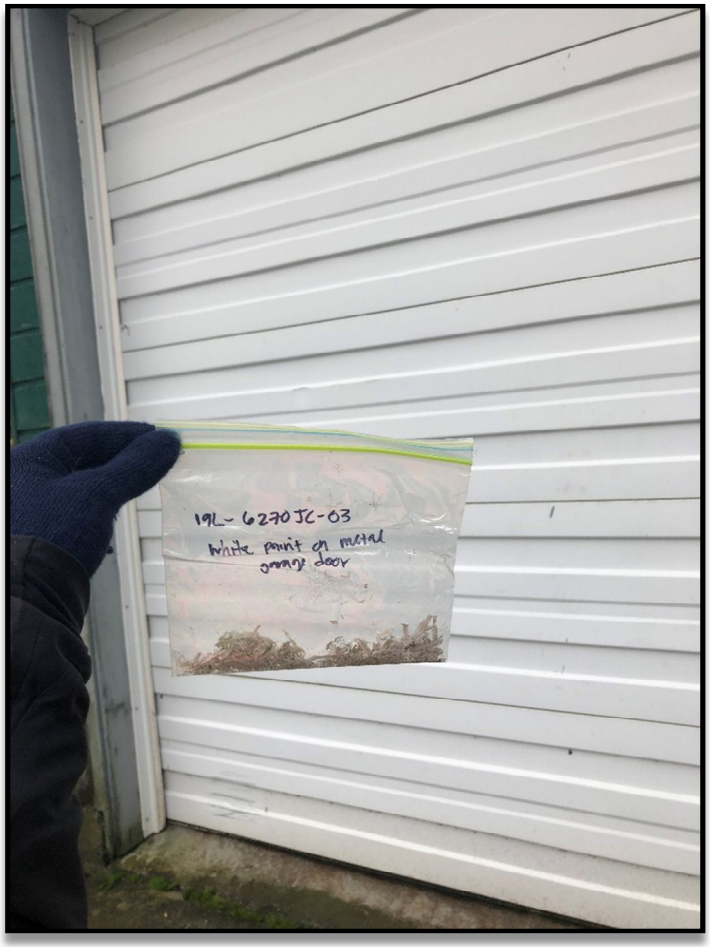
Upper residence bathroom showing 12” tan ceramic floor tile and 6” white ceramic wall tile (left).
Sample 19A-6270-JC-41 of 12” tan ceramic floor tile with grout and mortar was ‘None Detected’ for asbestos (centre).
Sample 19A-6270-JC-42 of 6” white ceramic wall tile with grout and mortar was ‘None Detected’ for asbestos (right).

Sample 19A-6270-JC-43 membrane between sill plate and perimeter foundation in the warehouse was 'None Detected' for asbestos (left).

Sample 19A-6270-JC-44 building paper between outer layer of OSB and exterior wood siding (coring) was 'None Detected' for asbestos (right).

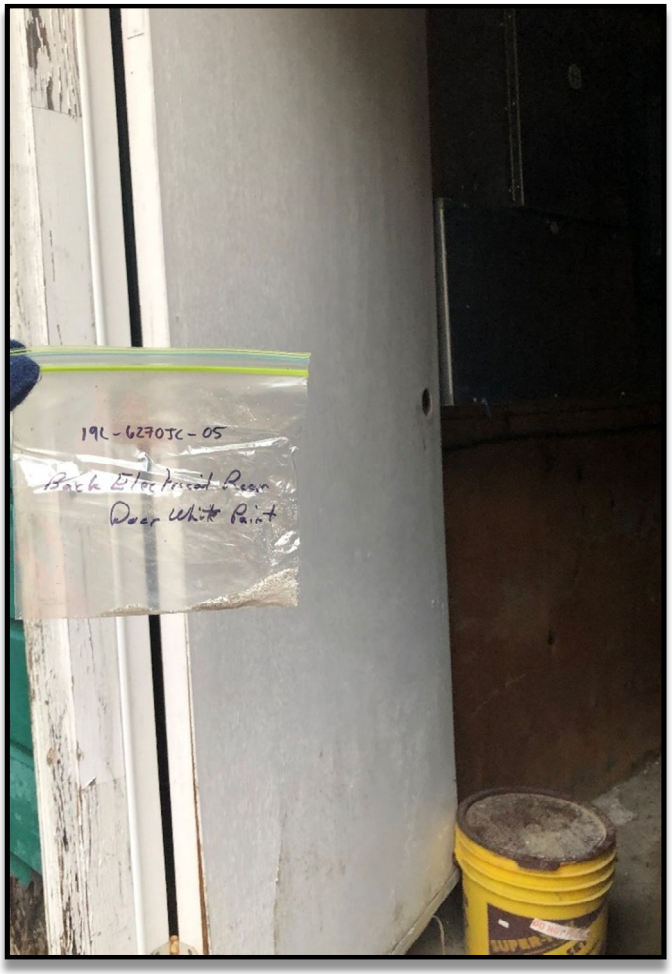
Cream paint sample 19L-6270JC-01 applied to the exterior metal doors with lead concentration: 0.041 wt% (410 ppm).

Grey paint sample 19L-6270JC-02 applied to the exterior wood trim with lead concentration: <0.0058 wt% (<58 ppm).

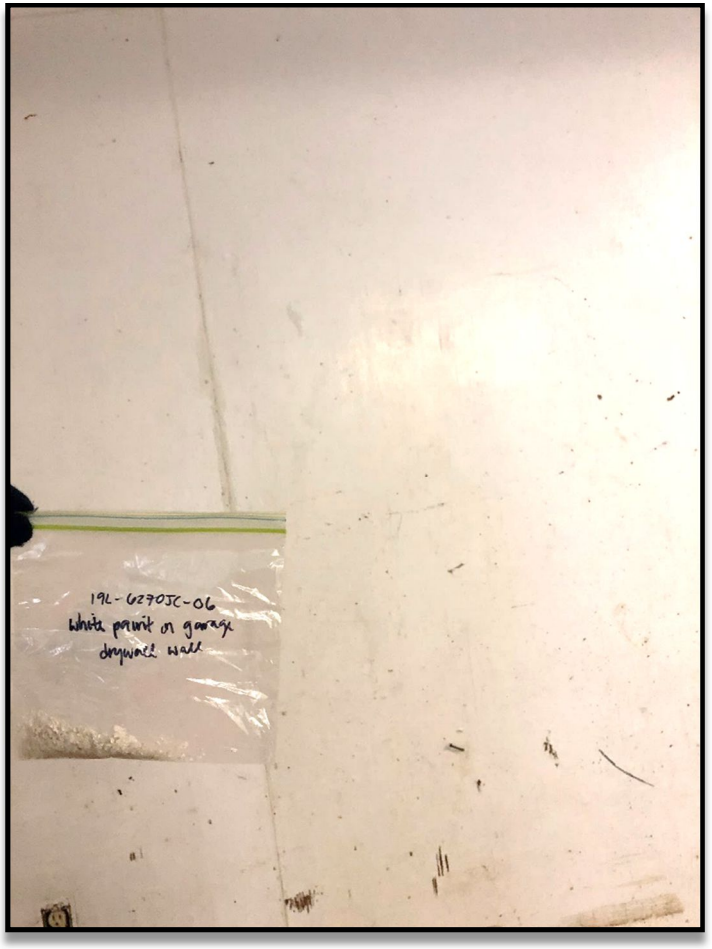


White paint sample 19L-6270JC-03 applied to the exterior of the roll-up metal door with lead concentration: <0.0083 wt% (<83 ppm).

Green paint sample 19L-6270JC-04 applied to the exterior wood siding with lead concentration: 0.022 wt% (220 ppm).



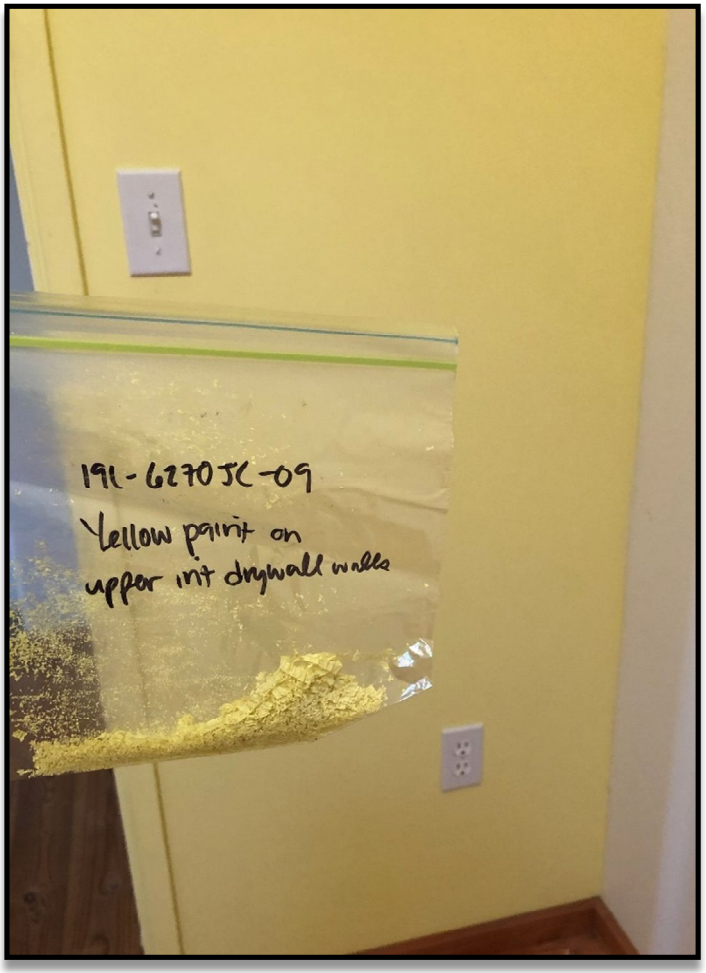
White paint sample 19L-6270JC-05 applied to the east electrical room door with lead concentration: <0.0057 wt% (<57 ppm).



White paint sample 19L-6270JC-06 applied to the warehouse plywood walls with lead concentration: 0.012wt% (120 ppm).

Layered grey paint sample 19L-6270JC-07 applied to the warehouse concrete floor with
lead concentration: 0.011 wt% (110 ppm).

Light grey paint sample 19L-6270JC-08 applied to the interior of the roll-up metal door with
lead concentration: <0.0084 wt% (<84 ppm).



Yellow paint sample 19L-6270JC-09 applied to the upper residence interior drywall walls with lead concentration: <0.0079 wt% (<79 ppm).

White paint sample 19L-6270JC-10 applied to the upper residence interior drywall walls with lead concentration: 0.0086 wt% (86 ppm).

Off-white paint sample 19L-6270JC-11 applied to the upper residence sub-floor at the entrance to the side attic with lead concentration: <0.0080 wt% (<80 ppm).

Fluorescent light fixtures within the upper residence kitchen (left), the east electrical room (centre) and the warehouse (right).

Fluorescent fixture lamp ballasts as inspected within the warehouse were found to be labeled “NON PCB”.

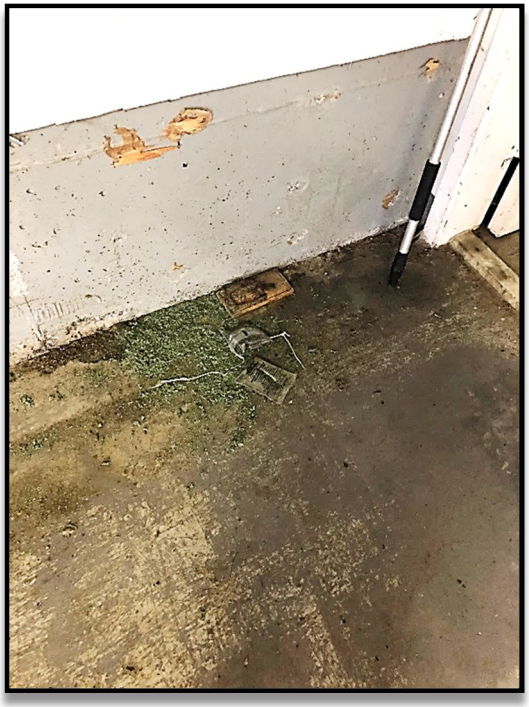
A domestic style refrigerator was observed in the kitchen which may contain ozone depleting substances (ODS).

Mould spotting was observed along the southwest vaulted drywall ceiling of the warehouse (left).

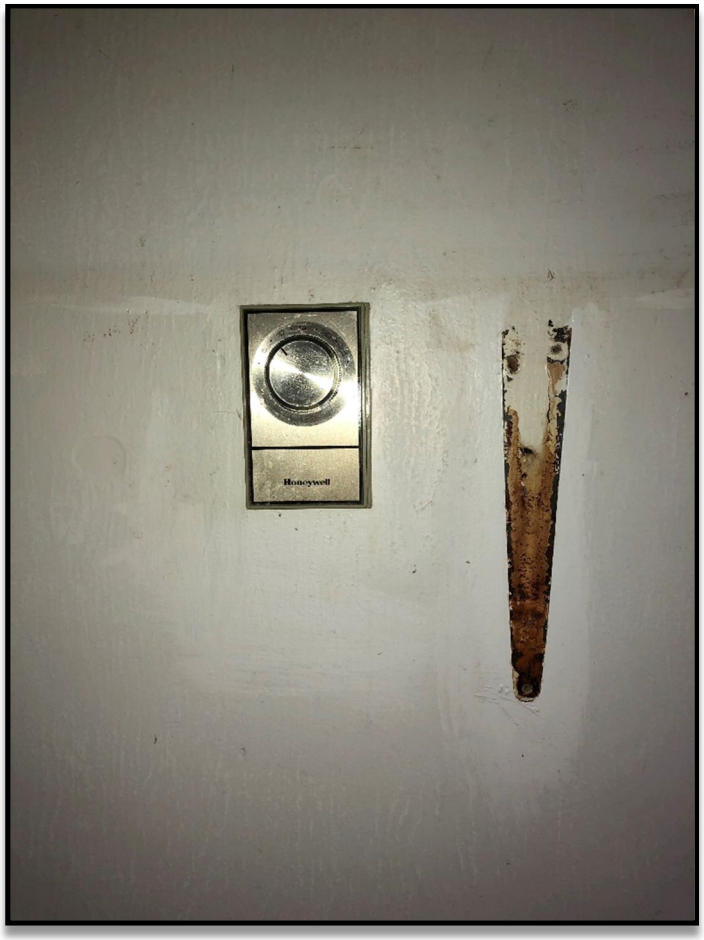
Water damage was observed on the underside of the plywood ceiling of the east electrical room (centre) and behind the ceramic tile bath tub surround in the upper residence (right).

Exterior area flood lamp fixtures as observed to be mounted on the upper portion of the northwest elevation wall.
The lamps are assumed to contain bulb(s) that are anticipated to be either metal halide or high pressure sodium bulbs.
Metal halide and high pressure sodium bulbs typically contain mercury and/or other heavy metals.

A wasp nest was observed on the interior wood framing above the doorway of the electrical room.



Rodent traps and loose green coloured poison were observed along the perimeter walls within the warehouse and adjacent washrooms and common room. Rodent traps and green coloured poison material should be assessed for potential presence of arsenic/rodent poison and/or be amended or remediated on site by a professional pest control service operator in order to limit potential exposure during normal occupancy access or during demolition process works.



Thermostats within the Subject Site were inspected and did not contain mercury filled glass activator switch bulbs.

A 20 litre container of unknown contents was observed in the ground level storage shed attached approximately midway along the southwest side of the building (left).

Three (3) smaller containers, two 4 litre containers of unknown contents and one 1 litre container marked muriatic acid, were observed in the ground level storage room under the access staircase (right).

APPENDIX

C CERTIFICATES OF ANALYSIS – ASBESTOS AND LEAD

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

9000 Commerce Parkway, Suite B • Mount Laurel, NJ 08054
Phone: 877-428-4285/856-231-9449 • Fax: 856-231-9818

Chain of Custody

–Bulk Asbestos –

Contact Information

Client Company:	WSP Canada Inc.	**Project Number:**	191-14959-00
Office Address:	760 Enterprise Crescent	**Project Name:**	DFO 6270 Jensen Cove DSS
City, State, Zip:	Victoria, British Columbia Canada	**Primary Contact:**	Gordon Philippe
Fax Number:	250-475-2211	**Office Phone:**	250-475-1000
Email Address:	Gordon.Philippe@WSP.com	**Cell Phone:**	250-360-6537

PLM Instructions:

- ■ PLM: Bulk Asbestos Building Materials EPA 600 R-93/116, 1993
- ☐ PLM: Bulk Asbestos Building Materials EPA 600 M-4/82-020, 1982
- ☐ PLM: Bulk Asbestos Building Materials NIOSH 9002, 1985
- ☐ PLM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.1, 2002
- ☐ PLM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.6, 2010
- ☐ TEM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.4, 2009

- ☐ PLM: Point Counting
  - ☐ PC: via ELAP 198.1
  - ☐ PC: 400 Points
  - ☐ PC: 800 Points *
  - ☐ PC: 1600 Points *
- ■ PLM: Instructions for Multi-Layered Samples
  - ■ Analyze and Report All Separable Layers per EPA 600
  - ☐ Report Composite for Drywall Systems per NESHAP
  - ☐ Report All Layers and Composite Where Applicable
  - ☐ Only Analyze and Report Specifically Noted Layer
- ☐ PLM: Analyze Until Positive (Positive Stop)
  - ☐ AUP: by Homogenous Area as Noted
  - ☐ AUP: by Material Type as Noted
- ☐ PLM: NOB via 198.6
  - ☐ PLM: Friable via EPA 600 2.3
  - ☐ If <1% by PLM, to TEM via 198.4 *
  - ☐ If <1% by PLM, Hold for Instructions
- ☐ PLM: Non-Building Material*,** (Dust, Wipe, Tape)
  - ☐ Soil or Vermiculite Analysis*
  - ☐ CARB 435

Special Instructions: _____

** Additional charge and turnaround may be required* *** Alternative Method (ex: EPA 600/R-04/004) may be recommended by Laboratory*

Turnaround Time

Preliminary Results Requested Date: _____ (Specific date / time) ☐ Verbal ■ Email ☐ Fax

☐ 10 Day ■ 5 Day ☐ 3 Day ☐ 2 Day ☐ 1 Day* ☐ 12 Hour** ☐ 6 Hour** ☐ RUSH**

* End of next business day unless otherwise specified. ** Matrix Dependent. ***Please notify the lab before shipping***

Chain of Custody

Relinquished (Name/Organization):	Gordon/WSP	Date:	Dec 20 2019	Time:	10:00
Received (Name / iATL):		Date:		Time:	
Sample Login (Name / iATL):		Date:		Time:	
Analysis(Name(s) / iATL):		Date:	1/3/2020	Time:	
QA/QC Review (Name / iATL):	KM 1/3/20	Date:		Time:	
Archived / Released: _____	QA/QC Inter LAB Use: _____	Date:		Time:	

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

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Phone: 877-428-4285/856-231-9449 • Fax: 856-231-9818

Sample Log

–Bulk Asbestos –

Client: WSP Canada Inc. Project: 191-14959-00/DFO 6270 Jensen Cove DSS

Sampling Date/Time: Dec 18 2019

Bulk Asbestos Sample Log			
Client Sample #	iATL #	Location/Description	Notes
19A-6270JC-17	6942067	DWJC - SE bed	
19A-6270JC-18	6942068	DWJC - SE bed	
19A-6270JC-19	6942069	DWJC - SE bed	
19A-6270JC-20	6942070	DWJC - SW bed	
19A-6270JC-21	6942071	DWJC - SW bed	
19A-6270JC-22	6942072	DWJC - SW bed	
19A-6270JC-23	6942073	Building paper (BP) - Upper behind wood siding	
19A-6270JC-24	6942074	BP roll in east attic	
19A-6270JC-25	6942075	Black mastic - Upper sliding door	
19A-6270JC-26	6942076	Black mastic - SE bed window	
19A-6270JC-27	6942077	Ceiling Texture Coat (CTC) - Upper LR	
19A-6270JC-28	6942078	CTC - SE bed	
19A-6270JC-29	6942079	CTC - SW bed	
19A-6270JC-30	6942080	Glue under upper hardwood	
19A-6270JC-31	6942081	BP - Under upper hardwood	
19A-6270JC-32	6942082	Glue behind plywood wall in garage	

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Sample Log

–Bulk Asbestos –

Client: WSP Canada Inc. Project: 191-14959-00/DFO 6270 Jensen Cove DSS

Sampling Date/Time: Dec 18 2019

Bulk Asbestos Sample Log			
Client Sample #	**iATL #**	**Location/Description**	**Notes**
19A-6270JC-33	6942083	Glue behind vinyl siding in garage	
19A-6270JC-34	6942084	Drywall Joint Compound (DWJC) - Lower SW	
19A-6270JC-35	6942085	DWJC - Lower SW	
19A-6270JC-36	6942086	DWJC - Lower SW	
19A-6270JC-37	6942087	DWJC - Lower SW	
19A-6270JC-38	6942088	DWJC - Lower SW	
19A-6270JC-39	6942089	Old roofing tar shingle from attic	
19A-6270JC-40	6942090	Roof core from attic (4 layers)	
19A-6270JC-41	6942091	12" floor tile/mortar/grout from upper bath	
19A-6270JC-42	6942092	6" wall tile/mortar/grout from upper bath	
19A-6270JC-43	6942093 6942094	Foundation sill plate membrane	
19A-6270JC-44	6942095	Building paper between plywood/wood siding	
19A-6270JC-45	6942096	DWJC - Lower NE	
19A-6270JC-46	6942097	DWJC - Lower NE	
19A-6270JC-47	6942098	DWJC - Lower centre	
19A-6270JC-48		DWJC - Lower centre	

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

9000 Commerce Parkway, Suite B • Mount Laurel, NJ 08054
Phone: 877-428-4285/856-231-9449 • Fax: 856-231-9818

Sample Log

–Bulk Asbestos –

Client: WSP Canada Inc. Project: 191-14959-00/DFO 6270 Jensen Cove DSS

Sampling Date/Time: Dec 18 2019

Bulk Asbestos Sample Log			
Client Sample #	**iATL #**	**Location/Description**	**Notes**
19A-6270JC-49	6942093	Drywall Joint Compound - Lower centre	

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/3/2020
Report No.: 606895 - PLM
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6942051
Client No.: 19A-6270JC-01
Analyst Observation: Black Mastic
Client Description: Black Mastic
Location: Ext. Foundation
Facility:

Percent Asbestos:
PC 0.25 *Chrysotile*

Percent Non-Asbestos Fibrous Material:
4 Fibrous Glass

Percent Non-Fibrous Material:
95.75

Lab No.: 6942052
Client No.: 19A-6270JC-02
Analyst Observation: Black Tar Paper
Client Description: Building Paper
Location: Electrical Room Wall
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
95 Cellulose

Percent Non-Fibrous Material:
5

Lab No.: 6942053
Client No.: 19A-6270JC-03
Analyst Observation: White Joint Compound
Client Description: Drywall Joint Compound (DWJC)
Location: Upper Column
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942054
Client No.: 19A-6270JC-04
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper Column
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942055
Client No.: 19A-6270JC-05
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper LR
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942056
Client No.: 19A-6270JC-06
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper LR
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/03/2020
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/3/2020
Report No.: 606895 - PLM
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6942057
Client No.: 19A-6270JC-07
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper LR
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942058
Client No.: 19A-6270JC-08
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper LR
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942059
Client No.: 19A-6270JC-09
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper LR
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942060
Client No.: 19A-6270JC-10
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper LR
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942061
Client No.: 19A-6270JC-11
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper Hallway
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942062
Client No.: 19A-6270JC-12
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper LR
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/03/2020
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/3/2020
Report No.: 606895 - PLM
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6942063
Client No.: 19A-6270JC-13
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper Hallway
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942064
Client No.: 19A-6270JC-14
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper Bath
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942065
Client No.: 19A-6270JC-15
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper Bath
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942066
Client No.: 19A-6270JC-16
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: Upper Bath
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942067
Client No.: 19A-6270JC-17
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: SE Bed
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942068
Client No.: 19A-6270JC-18
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: SE Bed
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/03/2020
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/3/2020
Report No.: 606895 - PLM
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6942069
Client No.: 19A-6270JC-19
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: SE Bed
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942070
Client No.: 19A-6270JC-20
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: SW Bed
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942071
Client No.: 19A-6270JC-21
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: SW Bed
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942072
Client No.: 19A-6270JC-22
Analyst Observation: White Joint Compound
Client Description: DWJC
Location: SW Bed
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942073
Client No.: 19A-6270JC-23
Analyst Observation: Black Tar Paper
Client Description: Building Paper (BP)
Location: Upper Behind Wood Siding
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
96 Cellulose

Percent Non-Fibrous Material:
4

Lab No.: 6942074
Client No.: 19A-6270JC-24
Analyst Observation: Black Tar Paper
Client Description: BP Roll
Location: East Attic
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
94 Cellulose
2 Fibrous Glass

Percent Non-Fibrous Material:
4

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/03/2020
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/3/2020
Report No.: 606895 - PLM
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6942075
Client No.: 19A-6270JC-25

Analyst Observation: Black Caulk
Client Description: Black Mastic

Location: Upper Siding Door
Facility:

Percent Asbestos:
PC 1.3 *Chrysotile*

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
98.7

Lab No.: 6942076
Client No.: 19A-6270JC-26

Analyst Observation: Black Caulk
Client Description: Black Mastic

Location: SE Bed Window
Facility:

Percent Asbestos:
PC 1.2 *Chrysotile*

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
98.8

Lab No.: 6942077
Client No.: 19A-6270JC-27

Analyst Observation: White Ceiling Texture
Client Description: Ceiling Texture Coat (CTC)

Location: Upper LR
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
1 Cellulose

Percent Non-Fibrous Material:
99

Lab No.: 6942078
Client No.: 19A-6270JC-28

Analyst Observation: White Ceiling Texture
Client Description: CTC

Location: SE Bed
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
2 Cellulose

Percent Non-Fibrous Material:
98

Lab No.: 6942079
Client No.: 19A-6270JC-29

Analyst Observation: White Ceiling Texture
Client Description: CTC

Location: SW Bed
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
2 Cellulose

Percent Non-Fibrous Material:
98

Lab No.: 6942080
Client No.: 19A-6270JC-30

Analyst Observation: Yellow Glue
Client Description: Glue Under Upper Hardwood

Location:
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/03/2020
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

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Telephone: 856-231-9449
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CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/3/2020
Report No.: 606895 - PLM
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6942081
Client No.: 19A-6270JC-31

Analyst Observation: Black Tar Paper
Client Description: BP Under Upper Hardwood

Location:
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
94 Cellulose
2 Fibrous Glass

Percent Non-Fibrous Material:
4

Lab No.: 6942082
Client No.: 19A-6270JC-32

Analyst Observation: Tan/Grey Mastic/Leveling Compound
Client Description: Glue

Location: Behind Plywood Wall In Garage
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942083
Client No.: 19A-6270JC-33

Analyst Observation: Tan Mastic
Client Description: Glue

Location: Behind Vinyl Siding In Garage
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
1 Cellulose

Percent Non-Fibrous Material:
99

Lab No.: 6942084
Client No.: 19A-6270JC-34

Analyst Observation: White Joint Compound
Client Description: Drywall Joint Compound (DWJC)

Location: Lower SW
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942085
Client No.: 19A-6270JC-35

Analyst Observation: White Joint Compound
Client Description: DWJC

Location: Lower SW
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942086
Client No.: 19A-6270JC-36

Analyst Observation: White Joint Compound
Client Description: DWJC

Location: Lower SW
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/03/2020
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

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Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/3/2020
Report No.: 606895 - PLM
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6942087
Client No.: 19A-6270JC-37

Analyst Observation: White Joint Compound
Client Description: DWJC

Location: Lower SW
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942088
Client No.: 19A-6270JC-38

Analyst Observation: White Joint Compound
Client Description: DWJC

Location: Lower SW
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942089
Client No.: 19A-6270JC-39

Analyst Observation: Black Shingle
Client Description: Old Roofing Tar Shingle

Location: Attic
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
20 Cellulose

Percent Non-Fibrous Material:
80

Lab No.: 6942090
Client No.: 19A-6270JC-40

Analyst Observation: Black Tar
Client Description: Roof Core (4 Layers)

Location: Attic
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
25 Cellulose

Percent Non-Fibrous Material:
75

Layers not separable.

Lab No.: 6942091
Client No.: 19A-6270JC-41

Analyst Observation: Tan Ceramic
Client Description: 12" Floor Tile/Mortar/Grout

Location: Upper Bath
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 6942091(L2)
Client No.: 19A-6270JC-41

Analyst Observation: Tan Grout
Client Description: 12" Floor Tile/Mortar/Grout

Location: Upper Bath
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/03/2020
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

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Mt. Laurel, New Jersey 08054
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Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/3/2020
Report No.: 606895 - PLM
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6942091(L3)
Client No.: 19A-6270JC-41
Analyst Observation: Grey Leveling Compound
Client Description: 12" Floor Tile/Mortar/Grout
Location: Upper Bath
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942092
Client No.: 19A-6270JC-42
Analyst Observation: White Ceramic
Client Description: 6" Wall Tile/Mortar/Grout
Location: Upper Bath
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942092(L2)
Client No.: 19A-6270JC-42
Analyst Observation: White Grout
Client Description: 6" Wall Tile/Mortar/Grout
Location: Upper Bath
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942092(L3)
Client No.: 19A-6270JC-42
Analyst Observation: White Mastic
Client Description: 6" Wall Tile/Mortar/Grout
Location: Upper Bath
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: 1 Cellulose
Percent Non-Fibrous Material: 99

Lab No.: 6942093
Client No.: 19A-6270JC-43
Analyst Observation: Black Backing Material
Client Description: Foundation Sill Plate Membrane
Location:
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: 75 Cellulose
Percent Non-Fibrous Material: 25

Lab No.: 6942094
Client No.: 19A-6270JC-44
Analyst Observation: Black Paper
Client Description: Building Paper Between Plywood/Wood Siding
Location:
Facility:

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: 80 Cellulose
Percent Non-Fibrous Material: 20

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/03/2020
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

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CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/3/2020
Report No.: 606895 - PLM
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6942095 | **Analyst Observation:** White Joint Compound | **Location:** Lower NE
Client No.: 19A-6270JC-45 | **Client Description:** DWJC | **Facility:**

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942096 | **Analyst Observation:** White Joint Compound | **Location:** Lower NE
Client No.: 19A-6270JC-46 | **Client Description:** DWJC | **Facility:**

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942097 | **Analyst Observation:** White Joint Compound | **Location:** Lower Center
Client No.: 19A-6270JC-47 | **Client Description:** DWJC | **Facility:**

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942098 | **Analyst Observation:** White Joint Compound | **Location:** Lower Center
Client No.: 19A-6270JC-48 | **Client Description:** DWJC | **Facility:**

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Lab No.: 6942099 | **Analyst Observation:** White Joint Compound | **Location:** Lower Center
Client No.: 19A-6270JC-49 | **Client Description:** DWJC | **Facility:**

Percent Asbestos: *None Detected*
Percent Non-Asbestos Fibrous Material: None Detected
Percent Non-Fibrous Material: 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/03/2020
Signature:
Analyst: Ellen Smith

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

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Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client:	WSP Canada Inc	Report Date:	1/3/2020
	760 Enterprise Crescent	Report No.:	606895 - PLM
	Victoria BC V8Z 6R4	Project:	DFO 6270 Jensen Cove DSS
		Project No.:	191-14959-00
Client:	WSP786		

Appendix to Analytical Report

Customer Contact:
Method: 40 CFR Appendix E to Subpart E of Part 763, interim method for the Determination of Asbestos in Bulk Insulation Samples, and USEPA 600, R93-116 as needed.

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com
iATL Office Manager: wchampion@iatl.com
iATL Account Representative: Shirley Clark
Sample Login Notes: See Batch Sheet Attached
Sample Matrix: Bulk Building Materials
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and ir our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

Information Pertinent to this Report:

Analysis by US EPA 600 93-116: Determination of Asbestos in Bulk Building Materials by Polarized Light Microscopy (PLM).

Certifications:

- NIST-NVLAP No. 101165-0
- NYSDOH-ELAP No. 11021
- AIHA-LAP, LLC No. 100188

Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. PC Trace represents a <0.25% amount. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analytical Methodology Alternatives: Your initial request for analysis may not have accounted for recent advances in regulatory requirements or advances in technology that are routinely used in similar situations for other qualified projects. You may have the option to explore additional analysis for further information. Below are a few options, listed as the matrix followed by the appropriate methodology. Also included are links to more information on our website.

Bulk Building Materials that are Non-Friable Organically Bound (NOB) by Gravimetric Reduction techniques employing PLM and TEM: ELAP 198.6 (PLM-NOB), ELAP 198.4 (TEM-NOB)

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Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client:	WSP Canada Inc	Report Date:	1/3/2020
	760 Enterprise Crescent	Report No.:	606895 - PLM
	Victoria BC V8Z 6R4	Project:	DFO 6270 Jensen Cove DSS
		Project No.:	191-14959-00
Client:	WSP786		

Loose Fill Vermiculite Insulation, Attic Insulation, Zonolite (copyright), etc.: US EPA 600 R-4/004 (multi-tiered analytical process)
Sprayed On Insulation/Fireproofing with Vermiculite (SOF-V): ELAP 198.8 (PLM-SOF-V)

Soil, sludge, sediment, aggregate, and like materials analyzed for asbestos or other elongated mineral particles (ex. erionite, etc.): ASTM D7521, CARB 435, and other options available

Asbestos in Surface Dust according to one of ASTM's Methods (very dependent on sampling collection technique – by TEM): ASTM D 5755, D5756, or D6480

Various other asbestos matrices (air, water, etc.) and analytical methods are available.

Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a list with highlighted disclaimers that may be pertinent to this project. For a full explanation of these and other disclaimers, please inquire at **customerservice@iatl.com**.

1) Note: No mastic provided for analysis.
2) Note: Insufficient mastic provided for analysis.
3) Note: Insufficient material provided for analysis.
4) Note: Insufficient sample provided for QC reanalysis.
5) Note: Different material than indicated on Sample Log / Description.
6) Note: Sample not submitted.
7) Note: Attached to asbestos containing material.
8) Note: Received wet.
9) Note: Possible surface contamination.
10) Note: Not building material. 1% threshold may not apply.
11) Note: Recommend TEM-NOB analysis as per EPA recommendations.
12) Note: Asbestos detected but not quantifiable.
13) Note: Multiple identical samples submitted, only one analyzed.
14) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.080%.
15) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.125%.
16) Note: This sample contains >10% vermiculite mineral. See Appendix for Recommendations for Vermiculite Analysis.

Recommendations for Vermiculite Analysis:

Several analytical protocols exist for the analysis of asbestos in vermiculite. These analytical approaches vary depending upon the nature of the vermiculite mineral being tested (e.g. un-processed gange, homogeneous exfoliated books of mica, or mixed mineral composites).Please contact your client representative for pricing and turnaround time options available.

iATL recommends initial testing using the EPA 600/R-93/116 method. This method is specifically designed for the analysis of asbestos in bulk building materials. It provides an acceptable starting point for primary screening of vermiculite for possible asbestos.

Results from this testing may be inconclusive. EPA suggests proceeding to a multi-tiered analysis involving wet separation techniques in conjunction with PLM and TEM gravimetric analysis (EPA 600/R-04/004).

For New York State customers, NYSDOH requires disclaimers and qualifiers for various vermiculite containing samples that direct analysis via ELAP198.6 and ELAP198.8 for samples that contain >10% vermiculite mineral where ELAP198.6 may be used to evaluate the asbestos content of the material. However, any test result using ELAP198.6 will be reported with the following disclaimer: “ELAP198.6 method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing >10% vermiculite.”

Further information on this method and other vermiculite and asbestos issues can be found at the following: Agency for Toxic Substances and Disease Registry (ATSDR) www.atsdr.cdc.gov, United States Geological Survey (USGS) www.minerals.usgs.gov/minerals/, US EPA www.epa.gov/asbestos. The USEPA also has an informative brochure "Current Best Practices for Vermiculite Attic Insulation" EPA 747F03001 May 2003, that may assist the health and remediation professional.

The following is a summary of the analytical process outlines in the EPA 600/R-04/004 Method:

1)**Analytical Step/Method:** Initial Screening by PLM, EPA 600R-93/116
Requirements/Comments: Minimum of 0.1 g of sample. ~0.25% LOQ for most samples.

2)**Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

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CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/3/2020
Report No.: 606895 - PLM
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

3)**Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Floats" only.

4)**Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

5)**Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Suspension" only.

LOQ, Limit of Quantitation estimates for mass and volume analyses.
*With advance notice and confirmation by the laboratory.
**Approximately 1 Liter of sample in double-bagged container (~9x6 inch bag of sample).

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Phone: 877-428-4285/856-231-9449 • Fax: 856-231-9818

Chain of Custody

– Environmental Lead –

Contact Information

Client Company:	WSP Canada Inc.	**Project Number:**	191-14959-00
Office Address:	760 Enterprise Crescent	**Project Name:**	DFO 6270 Jensen Cove DSS
City, State, Zip:	Victoria, BC, Canada V8Z 6R4	**Primary Contact:**	Gordon Philippe
Fax Number:	250-475-2211	**Office Phone:**	250-475-1000
Email Address:	Gordon.Philippe@WSP.com	**Cell Phone:**	250-360-6537

iATL is accredited by the National Lead Laboratory Accreditation Program (NLLAP) to perform analytical testing of environmental samples for lead (Pb). The accreditation is through AIHA-LAP, LLC and several other nationally recognized state programs.

Matrix/Method:

- [x] Paint by AAS: ASTM D3335-85a, 2009
- [ ] Wipe/Dust by AAS: SW 846: 3050B: 700B, 2010
- [ ] Air by AAS: NIOSH 7082, 1994
- [ ] Soil by AAS: EPA SW 846 (Soil)
- [ ] Water by AAS-GF: ASTM D3559-03D, US EPA 200.9
- [ ] Other Metals (Cd, Zn, Cr) by AAS
- [ ] Toxicity Characteristic Leaching Procedure (TCLP) by AAS: US EPA 1311
- [ ] Other _____

Special Instructions:

_____

_____

Turnaround Time

Preliminary Results Requested Date: _____ (Specific date / time) ☐ Verbal ■ Email ☐ Fax

☐ 10 Day ■ 5 Day ☐ 3 Day ☐ 2 Day ☐ 1 Day* ☐ 12 Hour** ☐ 6 Hour** ☐ RUSH**

* End of next business day unless otherwise specified. ** Matrix Dependent. ***Please notify the lab before shipping***

Chain of Custody

Relinquished (Name/Organization):	Gordon / WSP	Date:	Dec 20 2019	Time:	10:00
Received (Name / iATL):		Date:		Time:	
Sample Login (Name / iATL):		Date:		Time:	
Analysis(Name(s) / iATL):	5/1/2/20	Date:		Time:	
QA/QC Review (Name / iATL):	5/14/20	Date:		Time:	
Archived / Released: _____	QA/QC InterLAB Use: _____	Date:		Time:	

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Phone: 877-428-4285/856-231-9449 • Fax: 856-231-9818

Sample Log

–Environmental Lead –

Client: WSP Canada Inc. Project: 191-14959-00/DFO 6270 Jensen Cove DSS

Sampling Date/Time: Dec 18 2019

Client Sample #	iATL #	Location/ Description
19L-6270JC-01	6941676	Cream paint on ext metal doors
19L-6270JC-02	6941677	Gray paint on ext wood trim
19L-6270JC-03	6941678	White paint on ext metal garage door
19L-6270JC-04	6941679	Green paint on ext wood siding
19L-6270JC-05	6941680	White paint on elect rm wood door
19L-6270JC-06	6941681	White paint on garage plywood wall
19L-6270JC-07	6941682	Layered grey paint on garage concrete floor
19L-6270JC-08	6941683	Light grey paint on int metal garage door
19L-6270JC-09	6941694	Yellow paint on upper int drywall walls
19L-6270JC-10	6941695	White paint on upper int drywall walls
19L-6270JC-11	6941686	Off-white paint under upper hardwood

** = Insufficient Sample Provided to Perform QC Reanalysis (<200mg)*
*** = Insufficient Sample Provided to Analyze (<50mg) ***= Matrix / Substrate Interference Possible*
FB = Method Requires the submittal of blank(s). ML = Multi Layered Sample. May result in inconsistent results.
These **preliminary results** are issued by iATL to expedite procedures by clients based upon the above data. iATL assumes that all of the sampling methods and data upon which these results are based, has been accurately supplied by the client. These results may not have been reviewed by the Laboratory Director. Final Certificate of Analysis will follow these preliminary results. The signed COA is to be considered the official results. All EPA, HUD, and NJDEP conditions apply.

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CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/2/2020
Report No.: 606874 - Lead Paint
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

LEAD PAINT SAMPLE ANALYSIS SUMMARY

Lab No.: 6941676 **Description:** Cream Paint On Ext Metal Doors **Result (% by Weight):** 0.041
Client No.: 19L-6270JC-01 **Location:** **Result (ppm):** 410
Comments:

Lab No.: 6941677 **Description:** Grey Paint On Ext Wood Trim **Result (% by Weight):** <0.0058
Client No.: 19L-6270JC-02 **Location:** **Result (ppm):** <58
Comments:

Lab No.: 6941678 **Description:** White Paint On Ext Metal Garage Door **Result (% by Weight):** <0.0083
Client No.: 19L-6270JC-03 **Location:** **Result (ppm):** <83
Comments: ***

Lab No.: 6941679 **Description:** Green Paint On Ext Wood Siding **Result (% by Weight):** 0.022
Client No.: 19L-6270JC-04 **Location:** **Result (ppm):** 220
Comments: ***

Lab No.: 6941680 **Description:** White Paint On Elect. Room Wood Door **Result (% by Weight):** <0.0057
Client No.: 19L-6270JC-05 **Location:** **Result (ppm):** <57
Comments:

Lab No.: 6941681 **Description:** White Paint On Garage Plywood Wall **Result (% by Weight):** 0.012
Client No.: 19L-6270JC-06 **Location:** **Result (ppm):** 120
Comments:

Lab No.: 6941682 **Description:** Layered Grey Paint On Garage Concrete **Result (% by Weight):** 0.011
Client No.: 19L-6270JC-07 Floor **Result (ppm):** 110
Location: **Comments:**

Lab No.: 6941683 **Description:** Light Grey Paint On Int Metal Door **Result (% by Weight):** <0.0084
Client No.: 19L-6270JC-08 **Location:** **Result (ppm):** <84
Comments: ***

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/02/2020
Signature: Chad Shaffer
Analyst: Chad Shaffer

Approved By: Frank E. Ehrenfeld, III
Laboratory Director

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/2/2020
Report No.: 606874 - Lead Paint
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

LEAD PAINT SAMPLE ANALYSIS SUMMARY

Lab No.: 6941684 **Description:** Yellow Paint On Upper Int Drywall Walls **Result (% by Weight):** <0.0079
Client No.: 19L-6270JC-09 **Location:** **Result (ppm):** <79
Comments:

Lab No.: 6941685 **Description:** White Paint On Upper Int Drywall Walls **Result (% by Weight):** 0.0086
Client No.: 19L-6270JC-10 **Location:** **Result (ppm):** 86
Comments:

Lab No.: 6941686 **Description:** Off-White Paint Under Upper Hardwood **Result (% by Weight):** <0.0080
Client No.: 19L-6270JC-11 **Location:** **Result (ppm):** <80
Comments: ***

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 01/02/2020
Signature: Chad Shaffer
Analyst: Chad Shaffer

Approved By: Frank E. Ehrenfeld, III
Laboratory Director

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client:	WSP Canada Inc	Report Date:	1/2/2020
	760 Enterprise Crescent	Report No.:	606874 - Lead Paint
	Victoria BC V8Z 6R4	Project:	DFO 6270 Jensen Cove DSS
		Project No.:	191-14959-00
Client:	WSP786		

Appendix to Analytical Report:

Customer Contact:
Method: ASTM D3335-85a, US EPA SW846 3050B:7000B

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com
iATL Office Manager:wchampion@iatl.com
iATL Account Representative: Shirley Clark
Sample Login Notes: See Batch Sheet Attached
Sample Matrix: Paint
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and ir our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

Information Pertinent to this Report:

Analysis by ASTM D3335-85a by AAS

Certification:
- National Lead Laboratory Program (NLLAP): AIHA-LAP, LLC No. 100188
- NYSDOH-ELAP No. 11021

This report meets the standards set forth in the EPA's National Lead Laboratory Accreditation Program (NLLAP) through the Laboratory Quality System Requirements (LQSR) Revision 3.0 November 5, 2007. All Environmental Lead Proficiency Analytical Testing (ELPAT) is through the AIHA-PAT established program.

Regulatory limit is 0.5% lead by weight (EPA/HUD guidelines). Recommend multiple sampling for all samples less than regulatory limit for confirmation.
All results are based on the samples as received at the lab. iATL assumes that appropriate sampling methods have been used and that the data upon which these results are based have been accurately supplied by the client.
Method Detection Limit (MDL) per EPA Method 40CFR Part 136 Apendix B.
Reporting Limit (RL) based upon Lowest Standard Determined (LSD) in accordance with AIHA-ELLAP policies.
LSD=0.2 ppm MDL=0.005% by weight. RL= 0.010% by weight (based upon 100 mg sampled).

Disclaimers / Qualifiers:

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Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 1/2/2020
Report No.: 606874 - Lead Paint
Project: DFO 6270 Jensen Cove DSS
Project No.: 191-14959-00

* Insufficient sample provided to perform QC reanalysis (<200 mg)
** Not enough sample provided to analyze (<50 mg)
*** Matrix / substrate interference possible.

< less than sign, signifies none-detected below the empirical value based upon sub-sampled mass. This is often below the Reporting Limit (see above).

IATL International Asbestos Testing Laboratories

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INFO@IATL.COM

DAILY QUALITY CONTROL DATA

LEAD SAMPLE ANALYSIS

(DATE: 01 / 02 / 20)

Standard	Total Lead (mg)	Percent Recovery **
Reagent Blank	0.000	< LOQ
Blank Spike	0.500	99
Lab Control Std	1.700	99
Matrix Spike - LBP *	0.48	90
Matrix Spike - Wipe *	0.40	95
Matrix Spike - Soil *		
Matrix spike - Air *	0.050	90
2.5 ppm Standard	0.25	95
10.0 ppm Standard	1.0	99
40.0 ppm Standard	4.0	98

AIHA-LAP, LLC No. 100188 **NYSDOH-ELAP No. 11021**

Analysis Method: ASTM D3335-85A
NIOSH 7082
EPA SW846 3050B 7000B

Comments: IATL assumes that all sampling complies with accepted methods.
All client supplied sampling data is assumed to be correct when calculating results.
Detection limit based upon 0.2 mg/L reporting limit and sample size.
* NIST Traceable.
** 80-120% acceptable limits.

Analyzed By: C. Shafer

Date: 1/2/20

Approved By: Frank E. Ehrenfeld, III
Laboratory Director

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

9000 Commerce Parkway, Suite B • Mount Laurel, NJ 08054
Phone: 877-428-4285/856-231-9449 • Fax: 856-231-9818

Chain of Custody

– Environmental Lead –

Contact Information

Client Company:	WSP Canada Inc.	**Project Number:**	191-14959-00
Office Address:	760 Enterprise Crescent	**Project Name:**	DFO 6270 Jensen Cove Rd DSS
City, State, Zip:	Victoria, BC, Canada V8Z 6R4	**Primary Contact:**	Gordon Philippe
Fax Number:	250-475-2211	**Office Phone:**	250-475-1000
Email Address:	Gordon.Philippe@WSP.com	**Cell Phone:**	250-360-6537

iATL is accredited by the National Lead Laboratory Accreditation Program (NLLAP) to perform analytical testing of environmental samples for lead (Pb). The accreditation is through AIHA-LAP, LLC and several other nationally recognized state programs.

Matrix/Method:

- ☐ Paint by AAS: ASTM D3335-85a, 2009
- ☐ Wipe/Dust by AAS: SW 846: 3050B: 700B, 2010
- ☐ Air by AAS: NIOSH 7082, 1994
- ☐ Soil by AAS: EPA SW 846 (Soil)
- ☐ Water by AAS-GF: ASTM D3559-03D, US EPA 200.9
- ☐ Other Metals (Cd, Zn, Cr) by AAS
- ☑ Toxicity Characteristic Leaching Procedure (TCLP) by AAS: US EPA 1311
- ☐ Other _____

Special Instructions:

Analyze only the provided samples for which the corresponding same sample # paint samples were previously analyzed by 'Paint by AAS: ASTM D3335-85a, 2009' and determined to have lead containing paint concentrations in excess of the 0.06% criteria (excess 600 mg/kg).

Turnaround Time

Preliminary Results Requested Date: _____ (Specific date / time) ☐ Verbal ■ Email ☐ Fax

■ 10 Day ☐ 5 Day ☐ 3 Day ☐ 2 Day ☐ 1 Day* ☐ 12 Hour** ☐ 6 Hour** ☐ RUSH**

* End of next business day unless otherwise specified. ** Matrix Dependent. ***Please notify the lab before shipping***

Chain of Custody

Relinquished (Name/Organization):	Gordon / WSP	Date:	Dec 20 2019	Time:	10:00
Received (Name / iATL):		Date:		Time:	
Sample Login (Name / iATL):		Date:		Time:	
Analysis(Name(s) / iATL):	MP	Date:	12/30/19	Time:	
QA/QC Review (Name / iATL):	MP 12/30/19	Date:		Time:	
Archived / Released: _____	QA/QC InterLAB Use: _____	Date:		Time:	

RECEIVED DEC 2 1 2019 ATL

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ASBESTOS TESTING LABORATORIES

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Sample Log

–Environmental Lead –

Client: WSP Canada Inc. Project: 191-14959-00/DFO 6270 Jensen Cove Rd DSS

Sampling Date/Time: 18 Dec 2019

Client Sample #	iATL #	Location/ Description
6270JC-TCLP02	6941698	Grey paint on ext wood trim - Same as 19L-6270JC-02
6270JC-TCLP04	6941699	Green paint on ext wood siding - Same as 19L-6270JC-04
6270JC-TCLP06	6941700	White paint on garage int plywood - Same as 19L-6270JC-06
6270JC-TCLP07	6941701	Grey paint on concrete floor of garage - Same as 19L-6270JC-07
6270JC-TCLP09	6941702	Yellow paint on int drywall walls of apartment - Same as 19L-6270JC-09
6270JC-TCLP10	6941703	White paint on int drywall walls of apartment - Same as 19L-6270JC-10

** = Insufficient Sample Provided to Perform QC Reanalysis (<200mg)*
*** = Insufficient Sample Provided to Analyze (<50mg) ***= Matrix / Substrate Interference Possible*
FB = Method Requires the submittal of blank(s). ML = Multi Layered Sample. May result in inconsistent results.
These **preliminary results** are issued by iATL to expedite procedures by clients based upon the above data. iATL assumes that all of the sampling methods and data upon which these results are based, has been accurately supplied by the client. These results may not have been reviewed by the Laboratory Director. Final Certificate of Analysis will follow these preliminary results. The signed COA is to be considered the official results. All EPA, HUD, and NJDEP conditions apply.

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Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 12/31/2019
Report No.: 606876 - Lead Paint
Project: DFO 6270 Jensen Cove Rd DSS
Project No.: 191-14959-00

LEAD PAINT SAMPLE ANALYSIS SUMMARY

Lab No.: 6941698 **Description:** Grey Paint **Result (% by Weight):** 0.014
Client No.: 6270JC-TCLP02 **Location:** On Ext Wood Trim **Result (ppm):** 140
Comments:

Lab No.: 6941699 **Description:** Grey Paint **Result (% by Weight):** 0.011
Client No.: 6270JC-TCLP04 **Location:** On Ext Wood Siding **Result (ppm):** 110
Comments:

Lab No.: 6941700 **Description:** White Paint **Result (% by Weight):** <0.0035
Client No.: 6270JC-TCLP06 **Location:** On Garage Int Plywood **Result (ppm):** <35
Comments:

Lab No.: 6941701 **Description:** Grey Paint **Result (% by Weight):** <0.0029
Client No.: 6270JC-TCLP07 **Location:** On Concrete Floor Of Garage **Result (ppm):** <29
Comments:

Lab No.: 6941702 **Description:** Yellow Paint **Result (% by Weight):** <0.0039
Client No.: 6270JC-TCLP09 **Location:** On Int Drywall Walls Of Apartment **Result (ppm):** <39
Comments:

Lab No.: 6941703 **Description:** White Paint **Result (% by Weight):** <0.0034
Client No.: 6270JC-TCLP10 **Location:** On Int Drywall Walls Of Apartment **Result (ppm):** <34
Comments:

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 12/30/2019
Signature: Mark Stewart
Analyst: Mark Stewart

Approved By: Frank E. Ehrenfeld, III
Laboratory Director

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client:	WSP Canada Inc	Report Date:	12/31/2019
	760 Enterprise Crescent	Report No.:	606876 - Lead Paint
	Victoria BC V8Z 6R4	Project:	DFO 6270 Jensen Cove Rd DSS
		Project No.:	191-14959-00
Client:	WSP786		

Appendix to Analytical Report:

Customer Contact:
Method: ASTM D3335-85a, US EPA SW846 3050B:7000B

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com
iATL Office Manager: wchampion@iatl.com
iATL Account Representative: Shirley Clark
Sample Login Notes: See Batch Sheet Attached
Sample Matrix: Paint
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and ir our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

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Information Pertinent to this Report:

Analysis by ASTM D3335-85a by AAS

Certification:
- National Lead Laboratory Program (NLLAP): AIHA-LAP, LLC No. 100188
- NYSDOH-ELAP No. 11021

This report meets the standards set forth in the EPA's National Lead Laboratory Accreditation Program (NLLAP) through the Laboratory Quality System Requirements (LQSR) Revision 3.0 November 5, 2007. All Environmental Lead Proficiency Analytical Testing (ELPAT) is through the AIHA-PAT established program.

Regulatory limit is 0.5% lead by weight (EPA/HUD guidelines). Recommend multiple sampling for all samples less than regulatory limit for confirmation.
All results are based on the samples as received at the lab. iATL assumes that appropriate sampling methods have been used and that the data upon which these results are based have been accurately supplied by the client.
Method Detection Limit (MDL) per EPA Method 40CFR Part 136 Apendix B.
Reporting Limit (RL) based upon Lowest Standard Determined (LSD) in accordance with AIHA-ELLAP policies.
LSD=0.2 ppm MDL=0.005% by weight. RL= 0.010% by weight (based upon 100 mg sampled).

Disclaimers / Qualifiers:

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CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 12/31/2019
Report No.: 606876 - Lead Paint
Project: DFO 6270 Jensen Cove Rd DSS
Project No.: 191-14959-00

* Insufficient sample provided to perform QC reanalysis (<200 mg)
** Not enough sample provided to analyze (<50 mg)
*** Matrix / substrate interference possible.

< less than sign, signifies none-detected below the empirical value based upon sub-sampled mass. This is often below the Reporting Limit (see above).

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CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 12/31/2019
Report No.: 606876 - Lead TCLP
Project: DFO 6270 Jensen Cove Rd DSS
Project No.: 191-14959-00

LEAD TCLP SAMPLE ANALYSIS SUMMARY

Lab No.:6941698 **Description:**Grey Paint **Total Lead (ppm):** 140
Client No.:6270JC-TCLP02 **Location:**On Ext Wood Trim **TCLP Result (mg/L):** <0.20

Lab No.:6941699 **Description:**Green Paint **Total Lead (ppm):** 110
Client No.:6270JC-TCLP04 **Location:**On Ext Wood Siding **TCLP Result (mg/L):** <0.20

Lab No.:6941700 **Description:**White Paint **Total Lead (ppm):** <35
Client No.:6270JC-TCLP06 **Location:**On Garage Int Plywood **TCLP Result (mg/L):** NA
Note: Samples containing less than (<) 100 mg/Kg Total Lead do not require TCLP analysis (Ref. 1311 Sec 1.2).

Lab No.:6941701 **Description:**Grey Paint **Total Lead (ppm):** <29
Client No.:6270JC-TCLP07 **Location:**On Concrete Floor Of Garage **TCLP Result (mg/L):** NA
Note: Samples containing less than (<) 100 mg/Kg Total Lead do not require TCLP analysis (Ref. 1311 Sec 1.2).

Lab No.:6941702 **Description:**Yellow Paint **Total Lead (ppm):** <39
Client No.:6270JC-TCLP09 **Location:**On Int Drywall Walls Of Apartment **TCLP Result (mg/L):** NA
Note: Samples containing less than (<) 100 mg/Kg Total Lead do not require TCLP analysis (Ref. 1311 Sec 1.2).

Lab No.:6941703 **Description:**White Paint **Total Lead (ppm):** <34
Client No.:6270JC-TCLP10 **Location:**On Int Drywall Walls Of Apartment **TCLP Result (mg/L):** NA
Note: Samples containing less than (<) 100 mg/Kg Total Lead do not require TCLP analysis (Ref. 1311 Sec 1.2).

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/24/2019
Date Analyzed: 12/31/2019
Signature: Mark Stewart
Analyst: Mark Stewart

Approved By: Frank E. Ehrenfeld, III
Laboratory Director

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: WSP Canada Inc
760 Enterprise Crescent
Victoria BC V8Z 6R4

Client: WSP786

Report Date: 12/31/2019
Report No.: 606876 - Lead TCLP
Project: DFO 6270 Jensen Cove Rd DSS
Project No.: 191-14959-00

Appendix to Analytical Report:

Customer Contact:
Analysis: AAS - US EPA 1311

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iATL Office Manager:wchampion@iatl.com
iATL Account Representative: Shirley Clark
Sample Matrix: Various
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

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iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

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This report shall not be reproduced except in full, without written approval of the laboratory.

Information Pertinent to this Report:

Analysis: Toxicity Characteristic Leaching Procedure (TCLP) by AAS: USEPA 1311

Certification: - NATIONAL LEAD LABORATORY ACCREDITATION PROGRAM (NLLAP)
NYSDOH-ELAP No. 11021

TCLP threshold value is 5.0 mg/L.

All results are based on the samples as received at the lab. iATL assumes that appropriate sampling methods have been used and that the data upon which these results are based have been accurately supplied by the client.
Method Detection Limit (MDL) per EPA Method 40 CFR Part 136 Appendix B. Reporting Limit (RL) based upon Lowest Standard Determined (LSD) in accordance with AIHA-ELLAP policies.
LSD = 0.2 ppmMDL = 4.7 mg/kgRL = 10 mg/kg (based upon 1000 mg sampled). Mg/kg = ppm.
Sample results are not corrected for contamination by field or analytical blanks.

* Samples containing 100 ppm total lead or more require TCLP analysis (Ref. 1311 Sec 1.2).

Disclaimers / Qualifiers:

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Note: Insufficient material to provide TCLP analysis.(<55grams)

APPENDIX

D PUBLIC SERVICES AND PROCUREMENT CANADA – ASBESTOS MATERIALS SURVEY – EVALUATION OF ASBESTOS-CONTAINING MATERIALS AND RECOMMENDATIONS FOR CONTROL

ASBESTOS-CONTAINING MATERIAL EVALUATION CRITERIA

A description of the criteria used in evaluating the condition, accessibility and exposure risk of asbestos-containing materials (ACM) is provided below.

ASSESSMENT OF CONDITION

SPRAY-APPLIED FIREPROOFING, INSULATION AND TEXTURE FINISHES

In evaluating the condition of ACM spray applied as fireproofing, thermal insulation or texture, decorative or acoustic finishes, the following criteria apply:

Good

Surface of material shows no significant signs of damage, deterioration or delamination. Up to one percent visible damage to surface is allowed within range of **GOOD**. Evaluation of sprayed fireproofing requires the Assessor to be familiar with the irregular surface texture typical of sprayed asbestos products. **GOOD** condition includes un-encapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

Poor

Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of ACM spray. In observation areas, where damage exists in isolated locations, both **GOOD** and **POOR** condition may be reported. The extent or percentage of each condition will be recorded on the Assessor reassessment form.

Fair condition is not utilized or considered as a valid criterion in the evaluation of sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling area are advised to be watchful for ACM DEBRIS prior to accessing or working above ceilings in areas of building with ACM, regardless of the reported condition.

MECHANICAL INSULATION

In evaluating the condition of mechanical insulation (on boilers, breaching, ductwork, piping, tanks, equipment etc.) the following criteria are used:

Good

Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.

Fair

Minor penetration damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.

Poor

Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. In these circumstances, it is not possible to observe each foot of mechanical insulation from all angles.

NON-FRIABLE AND POTENTIALLY FRIABLE MATERIALS

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material will be treated as a friable product.

DEBRIS FROM FRIABLE ACM

The presence of fallen friable asbestos-containing material is noted separately from the presumed friable asbestos-containing material source (sprayed fireproofing, thermal insulation, texture, decorative or acoustic finishes or mechanical insulation) and is referred to as debris.

The presence of fallen asbestos-containing material from damaged non-friable asbestos-containing material is reported separately from the non-friable asbestos-containing material source. Fallen non-friable asbestos-containing material that has become friable is reported as debris. Workers are advised to be watchful for the presence of debris prior to accessing, or working in proximity to, mechanical insulation or above ceiling areas of buildings with asbestos-containing material, regardless of the reported presence or absence of debris.

DETECTION LIMIT OF BULK ANALYSIS

ACM is defined as any material found to contain asbestos at or above the limit defined by provincial/territorial standards for an ACM, as determined by the allowable analytical method for the analysis of bulk samples (refer to Asbestos Management Standard, Section 6.1.2.2. Laboratory material analysis). Except in the case of vermiculite, the provincially/territorially-regulated limits or generally-accepted guidelines to consider a material as an ACM, subject to asbestos in buildings regulation, are provided as follows:

Minimum concentration to consider as an asbestos-containing material (by province)
- Quebec (includes part of National Capital Area): 0.1%
- Alberta, Manitoba, Saskatchewan (for friable material): 0.1%
- Ontario (includes part of National Capital Area) British Columbia: 0.5%
- Nova Scotia: 0.5%
- all other provinces and territories (non-friable material in Manitoba, Saskatchewan): 1.0%

Note that these concentrations may change with regulatory amendments, therefore applicable legislation should be consulted to confirm that they are still valid.

Vermiculite is considered an asbestos-containing material in the presence of any concentration of asbestos measured in a composite sample taken in accordance with provincial/territorial sampling standards.

EVALUATION OF ACCESSIBILITY

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

Access (A)
Areas of the building within reach of all building users. Includes areas such as gymnasiums, workshops, and storage areas where activities of the building users may result in disturbance of ACM not normally within reach from floor level.

Access (B)
Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder. Includes: frequently entered pipe chases, tunnels and service areas or areas within reach from a fixed ladder or catwalk, i.e., tops of equipment, mezzanines.

Access (C) Exposed
Areas of the building above 8'0" where use of a ladder is required to reach the ACM. Only refers to ACM materials that are exposed to view, from the floor or ladder, without removing or opening other building components such as ceiling tiles, or service access doors or hatches. Does not include infrequently accessed service areas of the building.

Access (C) Concealed
Areas of the building which require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems. Includes rarely entered crawl spaces, attic spaces, etc. Observations are limited to the extent visible from the access points.

Access (D)
Areas of the building behind inaccessible solid ceiling systems, walls, or mechanical equipment, etc. where demolition of the ceiling, wall or equipment, etc., is required to reach the ACM. Evaluation of the condition and extent of ACM is limited or impossible, depending on the Assessor's ability to visually examine the materials in Access D.

DEFINITION OF ACTION LEVELS

Based on the results of the inspection and bulk sample analysis of samples collected and submitted for testing, recommendations were provided for compliance with regulation. These include assigned "Action Levels" to assist in the prioritization of corrective measures. The Action Matrix provided below establishes the recommended asbestos control action. The measures that are to be taken for each "Action Level" are described in full following the matrix.

ACM ACTION MATRIX				
Access	**Condition**			**Debris**
	Good	**Fair**	**Poor**	
(A)	ACTION 5/7[1]	ACTION 5/6[2]	ACTION 3	ACTION 1
(B)	ACTION 7	ACTION 6/5[3]	ACTION 3	ACTION 1
(C) exposed	ACTION 7	ACTION 6	ACTION 4	ACTION 2

1. If material in ACCESS (A)/GOOD condition is not removed ACTION 7 is required.
2. If material in ACCESS (A)/FAIR condition is not removed ACTION 6 is required.
3. Remove ACM in ACCESS (B)/FAIR condition if ACM is likely to be disturbed.
4. Suspect ACM are to comply with ACTION 8 requirements.

ACTION LEVEL	REQUIRED ACTION
"ACTION 1"	***Immediate Clean-Up of Debris that is Likely to Be Disturbed*** Restrict access that is likely to cause a disturbance of the ACM DEBRIS and clean up ACM DEBRIS immediately. Utilize correct asbestos procedures. This action is required for compliance with regulatory requirements. The surveyor will immediately notify the owner of this condition.
"ACTION 2"	***Entry into Areas with ACM DEBRIS requires Intermediate Risk Precautions*** At locations where ACM DEBRIS can be isolated in lieu of removal or cleaned up, use appropriate means to limit entry to the area. Restrict access to the area is restricted to persons using intermediate risk asbestos0work precautions. The precautions will be required until the ACM DEBRIS has been cleaned up, and the source of the DEBRIS has been stabilized or removed following intermediate risk (if minor) or high risk precautions.
"ACTION 3"	***ACM Removal Required for Compliance*** Remove ACM for compliance with regulatory requirements. Utilize asbestos procedures appropriate to the scope of the removal work.
"ACTION 4"	***Access into Areas Where ACM is Present & Likely to be Disturbed by Access Requires Intermediate Risk Precautions*** Intermediate risk asbestos precautions are to be used when entry or access into an area is likely to disturb the ACM. ACTION 4 must be used until the ACM is removed (Use ACTION 1 or 2 if DEBRIS is present). Intermediate risk or high risk precautions should be used for removal (depending on extent of removal).
"ACTION 5"	***Proactive ACM Removal*** Remove ACM in lieu of repair may be considered, even if it is in **Good** condition at locations, where ACM is easily accessible, limited in quantity, and removal would be cost-effective.
"ACTION 6"	***ACM Repair*** ACM may be repaired if found in **FAIR** condition and not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the repair work, ACM is to be treated as being in **GOOD** condition and **ACTION 7** is to be implemented. If ACM is likely to be damaged or disturbed, during normal use of the area or room, **ACTION 5** is to be implemented.
"ACTION 7"	***Routine Surveillance*** Routine surveillance of the ACM is to be instituted. Trained workers or service providers must use appropriate asbestos precautions (low, intermediate or high) during disturbance of the remaining ACM.

Appendix E

Best Management Practices for Pile Driving and Related Operations

APPENDIX B

DFO Best Management Practices for Pile Driving & Related Operations

Best Management Practices for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association - March, 2003

The BC Marine and Pile Driving Contractors Association and Fisheries and Oceans Canada (DFO) have developed a Best Management Practices Policy for pile driving operations and related activities when working on the water within the province of British Columbia.

The Pile Driving Industry utilizes many different construction methods, equipment and materials in order to complete the contractual obligations for its client. Hammers; including drop, diesel, air, vibratory and hydraulic, vibroflot, and rotary, air and churn drills are the primary instruments in a pile driving operation. These hammers and drills are supported by a wide variety of heavy equipment, including a range of conventional cranes (truck mounted, crawler and pedestal mounted), spud scows, support barges and other water borne equipment. The piling types include treated timber (primarily creosote), concrete and steel (pipe, h-beam and sheet). Construction projects have the potential to utilize a number of different combinations of equipment and materials. It is the purpose of this document to examine the characteristics of each potential combination and develop a Best Management Practices Policy that will meet the following criteria:

-Maximize environmental protection
-Avoid contravention of the Fisheries Act
-Provide construction services economically

1)- Basic Rules of Operation

When in an aquatic environment, contractors will employ the following BASIC Best Management Practices:

- All equipment will be maintained in good proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products.
- Storage of fuels and petroleum products will comply with safe operating procedures, including containment facilities in case of a spill.
- Pile cut-offs, waste or any miscellaneous unused materials will be recovered for either disposal in a designated facility or placed in storage. Under no circumstances will materials be deliberately thrown overboard.
- Contractors will have emergency spill equipment available whenever working near or on the water.
- Contractors, where possible, will position their water borne equipment in a manner that will minimize damage to identified fish habitat (i.e. eelgrass). Where possible, alternative methods will be employed (i.e.: use of anchors instead of spuds). In the event that circumstances will not allow an alternative, contractors will minimize the

damage and where required restore habitat to its original state at the completion of the project.

- Prior to the commencement of any work, the contractor will complete and forward the attached "Notice of Project" to the Department of Fisheries and Oceans. Letters of advice or Habitat Authorizations may be required, depending on the scope of work proposed.
- If contractors are working and a herring (or other fish) spawning occurs, the work will be temporarily suspended and the appropriate DFO contact notified.
- There will be no restriction of work during closure periods (the only exception being when spawning is present), provided the contractors employ an exclusion device (protective netting or geotextile material suspended in the water column around pile driving area) around the work area to prevent fish access or when required, an effective method of mitigating shock waves (bubble curtain).
- Whenever shock wave monitoring (hydrophone) is performed at a marine construction site and the findings are available to the contractor, the data will be forwarded to the BC Marine and Pile Driving Contractors Association and Svein Vagle at the Institute of Ocean Sciences in Sidney, BC. It is hoped that a database can be built that will catalogue work procedures and reflect the safest and most economical approach to protecting the fish and their habitat.

2)-Timber Piling (creosote):

When driving timber piling, the following Best Management Practices will be employed to minimize/prevent impact to marine fish and their habitat:

- Where possible, new timber piles will comply with the best Management Practices for the use of treated wood in aquatic environments as developed by the Canadian Institute of Treated Wood and the Western Wood Preservers Institute and the DFO document "Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in Aquatic Environments in the Pacific Region".
- Where the above is not possible creosote piling will stand (weather) for a minimum of 45 days prior to installation.
- These requirements are for new piling only. Reused piling will not be subject to any additional treatments, however, pilings with excessive creosote should be avoided.
- Timber piling is normally driven using a drop hammer, a diesel/air impact hammer or a small vibratory hammer. Because of the relative small diameter of the timber pile, and its excellent energy absorbing quality, there is little threat of sound pressure impacts to fish and their habitat when driving timber piles.
- Environmental monitoring of sound pressure impacts is not required.
- When demolition is required on timber pile structures, the contractor will remove the piling by mechanical means and avoid breaking the piling at the mud line or below. All demolition operations should be monitored in order to control and contain the construction debris and to determine whether there are any effects on fish.

3)-Concrete Piles

When driving concrete piles, regardless of which hammer is being used, the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

Less than 24 inch diameter

- The physical design of 24 inch concrete pile dictates that: 1/ the energy required must be controlled in order to prevent the pile from breaking and 2/ the concrete construction of the pile will absorb the energy. These two factors are expected to result in low level shock wave emission (less than 30 kPa.) and minimal or no effects to fish and their habitat should result.
- Environmental monitoring of sound pressure levels is generally not required.

Greater than 24 inch diameter

- When driving concrete piles with a diameter greater than 24 inches using an impact or hydraulic hammer, the following Best Management Practice will be employed to minimize the impact on fish habitat:
- Visual and hydrophone monitoring of the impact on fish by the sound waves emitted will be required. If sound pressures over 30 kPa is measured or a fish kill is evident, the contractor will introduce effective means of reducing the level of the shock waves. Appropriate mitigating measures would be the deployment of a bubble curtain over the full length of the wetted pile. This should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected.

4)-Steel Pipe Piles

Less than 18 inch diameter

When driving steel piles 18 inches in diameter and less, regardless of the type of hammer being used, the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

- Because of the small diameter of the pile it is assumed that the energy required to drive the pile to the final point of installation will not result in shock waves in excess of 30 kPa, therefore, protective measures to reduce shock waves are not expected to be required.

- If, however, ground conditions during pile installation cause a fish kill, work will cease and contractors will be responsible for introducing effective means of reducing the level of shock waves or will introduce measures that will prevent fish from entering the potentially harmful shock wave area. Appropriate mitigating measures would include the deployment a bubble curtain over the full length of the wetted pile. This technique should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected.

Greater than 24 inches in diameter

When driving steel pipe piles with a diameter greater than 24 inches using impact or hydraulic hammers, the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

- Hydrophone and visual monitoring of the effects of the shock waves on fish will be required. If a fish kill occurs, the contractor will introduce effective means of reducing the level of the shockwave. Appropriate mitigating measures would be the deployment of a bubble curtain over the full length of the wetted pile.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected.

5)-Steel Sheet Piles and H-piles

When driving steel sheet piles and H-piles with a drop hammer, an impact hammer or a vibratory hammer, the following Best Management Practices will be employed to minimize the impact on fish habitat:

- It is anticipated that the driving of these types of piles will not generate shock waves in excess of 30kPa, therefore, mitigating measures are not expected to be required.
- If, however, ground conditions during pile installation cause a fish kill, work will cease and contractors will be responsible for introducing effective means of reducing the level of shock waves or will introduce measures that will prevent fish from entering the potentially harmful shock wave area. Appropriate mitigating measures would include the deployment a bubble curtain over the full length of the wetted pile. This technique should reduce the shock waves to an acceptable level.
- If, despite the introduction of preventive measures, further visual/hydrophone monitoring reveals unacceptable conditions (fish kill or sound pressure over 30 kPa), then the work will stop immediately and the methods will be reviewed and corrected.

6)-Stone Column Construction

When installing stone column using a vibroflot, the following Best Management practices will be employed to minimize/prevent impacts to fish habitat:

- The vibrating action and air flush associated with the operation of the probe results in a high degree of turbidity. When this level exceeds the criteria as outlined in the British Columbia Approved Water Quality Guidelines, the contractor will introduce containment methods that are designed to isolate the contaminated area and to prevent fish from entering the contaminated area. Silt curtains and netting are two methods that can provide the necessary protection.
- When supplying the aggregate to the probe, the contractor will ensure that spillage is prevented, thereby providing additional protection to fish habitat.
- An independent environmental consultant will be used to monitor turbidity levels.

7)-Underwater Drilling and Blasting

When performing underwater drilling and blasting the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

<u>Underwater Drilling</u>

- Generally, drilling underwater is a process that has very little impact on fish or fish habitat. The procedure does not generate shock waves.
- Contractors will ensure that all attachments (hydraulic connections and couplings) are in good operating order and inspected prior to the start of every day. Spill kits and containment booms must be maintained on-site in case of spills.
- Depending on soil conditions and the potential for turbidity, drill cuttings will be deposited adjacent to the operation, contained on the sea bed or pumped to the surface for deposit into containment skiffs or scows for land disposal when it is determined that the drill cuttings are unsuitable for return to the environment.

<u>Underwater Blasting</u>

Contractors required to perform blasting underwater will provide the following protection to minimize/prevent impacts to fish habitat:

- Because of the potential for harmful shock waves resulting from a blast, a protection shield will surround the immediate blast area. This would be in the form of an air-induced bubble curtain, which has the primary purpose of absorbing the shock wave and a secondary purpose of preventing fish from entering the blast area.
- In order to protect against flying rock, mats (rubber) will be placed over the blasting area. The placement of the mats may also provide protection for any fish swimming in the immediate area.

- Monitoring of fish movement and concentrations will be conducted using a sounder to determine if fish herding or scaring techniques (seal bombs) can be utilized to reduce the presence of fish in the blast area.

8)-Cleaning out Pipe Piles:

When cleaning out pipe piles (i.e.: air lifting) the following Best Management Practices will be employed to minimize/prevent impacts to fish habitat:

- Generally, sediment contained in the pipe is will be pumped to the surface and processed through an approved containment system and disposed of at an approved landfill site.
- In exceptional circumstances, if the sediment is non-toxic, fish are not present in the area, and adjacent fish habitats are not a concern (contact DFO) it may be acceptable to:

1. Pump the sediment through a discharge tube and allowed it to settle in the immediate area with or without a silt curtain to contain the sediment.
2. Pump the sediment through a discharge tube and additional flex hosing and redirect it back to the base of the pile.

9) Containment of Concrete Residue and Water Run Off

When placing concrete in form work over or in water, the following Best Management Practices will be employed to minimize/prevent the impacts to fish habitat:

Pouring concrete

- Spills: When pouring concrete all spills of fresh concrete must be prevented. Concrete is toxic to fish due its high pH. If concrete is discharged from the transit mixer directly to the formwork or placed by wheelbarrow, proper sealed chutes must be constructed to avoid spillage. If the concrete is being placed with a concrete pump, all hose and pipe connections must be sealed and locked properly to ensure the lines will not leak or uncouple. Crews will ensure that concrete forms are not filled to overflowing.
- Sealing forms: All concrete forms will be constructed in a manner which will prevent fresh concrete or cement-laden water from leaking into the surrounding water.

Curing concrete

- When fresh water is used to cure concrete, the run off must be monitored for acceptable pH levels. If the pH levels are outside the allowable limits then the run off water must be contained and neutralized.

Grinding concrete

- When grinding cured concrete, the dust and fines entering the water must not exceed the allowable limits for suspended solids. When grinding green or incompletely cured concrete and the dust or fines are entering the water, pH

monitoring will be conducted to ensure allowable ranges are maintained. In the event that the levels are outside the acceptable ranges, preventative measures will be introduced. This may include introducing silt curtains to contain the solids and prevent fish from entering a contaminated area or constructing catch basins to recover the run off and neutralizing it prior to disposal.

Patching concrete

- Spills: When patching concrete, all spills must be contained and prevented from entering the water.

Washing hand tools, pumps and transit mixer

- All tools, pumps, pipes, hoses and trucks used for finishing, placing or transporting fresh concrete must be washed off in such a way as to prevent the wash water and excess concrete from entering the marine environment. The wash water will be contained and disposed of upland in an environmentally acceptable manner.

Whenever there is the possibility of contaminants entering water, the contractor will monitor pH levels to ensure acceptable levels.

APPENDIX

Fisheries and Oceans Canada

Contact List

Name	Telephone No.	Fax. No.

NOTICE OF PROJECT

To: Fisheries and Oceans Canada

Attention:

Fax. No.:

From: "Contractor"

Telephone No.:

Fax. No.:

Representative:

Please be advised of the following marine/pile driving project:

Project Name:

Project Location:

Project Manager/Superintendent:

Project Telephone No.:

Project Fax. No.:

Project commencement date:

Appendix F

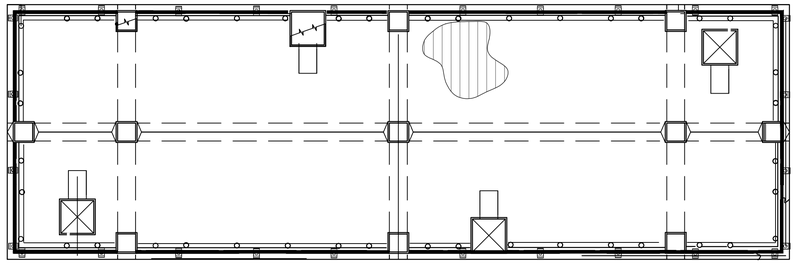
Concrete Float Drawings and Specifications and Towing Recommendations

FISHERIES AND OCEANS CANADA

SMALL CRAFT HARBOURS

STANDARD CONCRETE FLOAT MODULE

26.22m LONG x 8.537m WIDE x 1.695 DEEP



DRAWING LIST

DRAWING NUMBER	TITLE
56134-0801-R13CONCRETE FLOAT-SHEET 1	TITLE PAGE (THIS SHEET)
56134-0801-R8-CONCRETE FLOAT-SHEET 2	CONCRETE OUTLINE, PLANS
56134-0801-R6-CONCRETE FLOAT-SHEET 3	REINFORCEMENT, FLOAT PLAN AND SECTIONS
56134-0801-R6-CONCRETE FLOAT-SHEET 5	REINFORCEMENT AT FLOAT CORNERS & WALL SECTIONS
56134-0801-R9-CONCRETE FLOAT-SHEET 6	METALWORK DETAILS
56134-0801-R5-CONCRETE FLOAT-SHEET 7	FLOTATION BILLET LAYOUTS AND HOISTING GUIDELINES
56134-0801-R5-CONCRETE FLOAT-SHEET 12	MODIFICATION DETAILS – FLOAT CORNER WITHOUT FLOAT TO FLOAT STEEL BAR CONNECTORS
56134-0801-R7-CONCRETE FLOAT-SHEET 13	QUAD TYPE II PLAN VIEW LAYOUT – CONCRETE OUTLINE, QUAD FLOAT WITH STAGGERED WELLS
56134-0801-R5-CONCRETE FLOAT-SHEET 15	LOCATION OF DRAIN HOLES & EMBEDS-STD
56134-0801-R2-CONCRETE FLOAT-SHEET 18	DUAL TYPE II – CONCRETE OUTLINE
56134-0801-0 -CONCRETE FLOAT-SHEET 31	HARTLEY BAY SEARCH AND RESCUE PONTOON
56134-0801-0 -CONCRETE FLOAT-SHEET 32	HARTLEY BAY BREAKWATER PONTOON
56134-0801-0 -CONCRETE FLOAT-SHEET 33	HARTLEY BAY DETAILS
56134-0801-0 -CONCRETE FLOAT-SHEET 34	HARTLEY BAY DETAILS

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TETRA TECH

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
GAWDIN
11614
2019-04-11

0	ISSUED FOR TENDER	2019-03-27
revisions		date

A detail no. / no. du detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

project / projet

FISHERIES AND OCEANS CANADA REAL PROPERTY, SAFETY AND SECURITY CONCRETE FLOAT DOCK

drawing / dessin

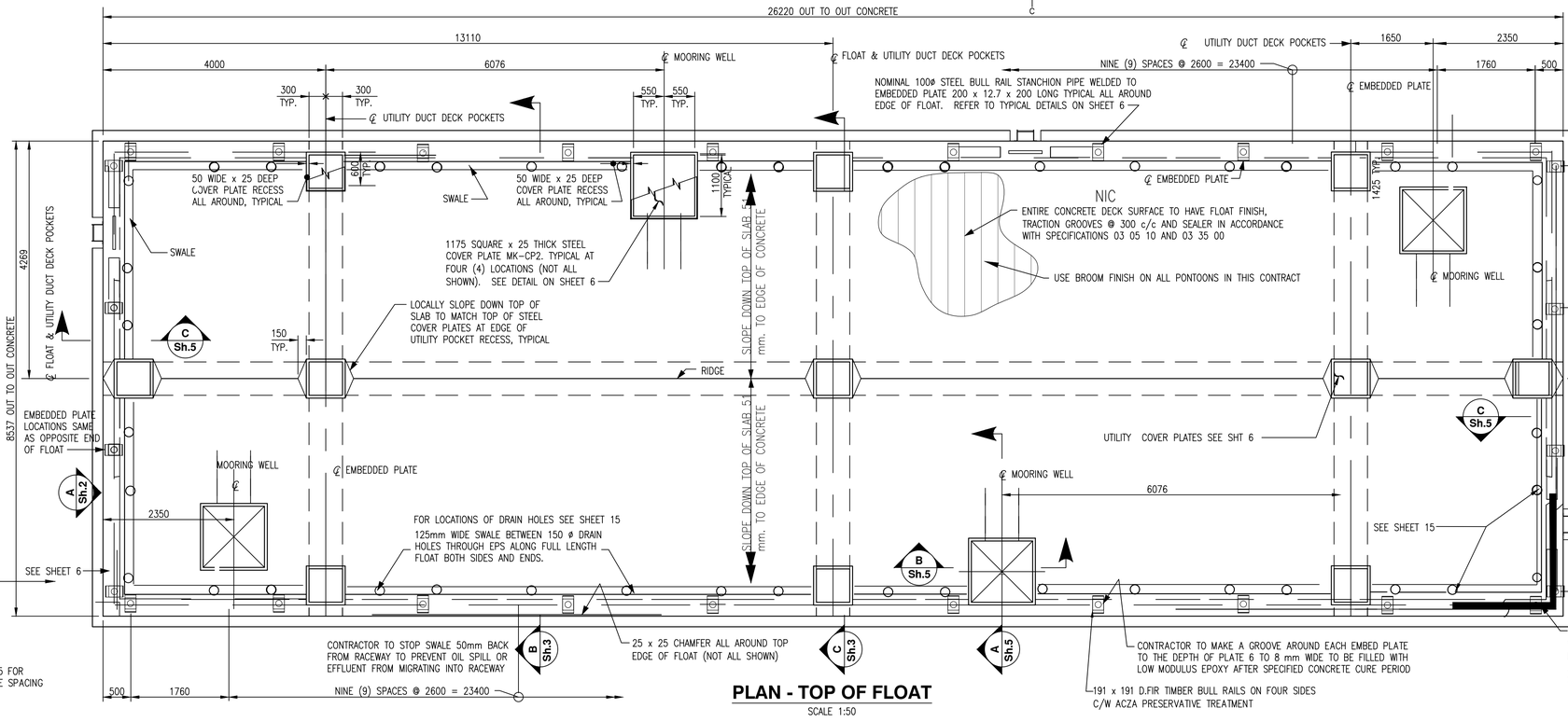
PLAN of Standard Float

designed G.J. Gawdin — concu
date 2019-03-27
drawn PS — dessine
date 2019-03-27
approved — approuve
date
Tender — Soumission
PWGSC Project Manager — Administrateur de projets TPSGC

project number / no. du projet
TRNVHWY03002-13

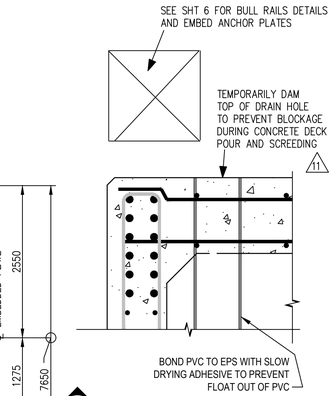
drawing no. / no. du dessin
56134 - 0801 - R13 - CONCRETE FLOAT - SHEET 1

Plot Scale: 1:1
PWGSC B1
0 10 20mm 40 60 80 100 120 140 160 180 200mm



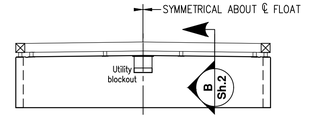
PLAN - TOP OF FLOAT

SCALE 1:50



SECTION C

SCALE 1:10 — C Sh.2



END VIEW

SCALE 1:100 — A Sh.2 (BOTH ENDS OF FLOAT)

PLAN VIEW - SECTION TAKEN NEAR BOTTOM OF UTILITY DUCTS

SCALE 1:50

SECTION

SCALE 1:10 — B Sh.2

Plot Scale: 1:1

PWGSC B1

0 10 20mm 40 60 80 100 120 140 160 180 200mm

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TETRA TECH

0	ISSUED FOR TENDER	2019-03-27
revisions		date

A detail no. no. du detail
B location drawing no. sur dessin no.
C drawing no. dessin no.

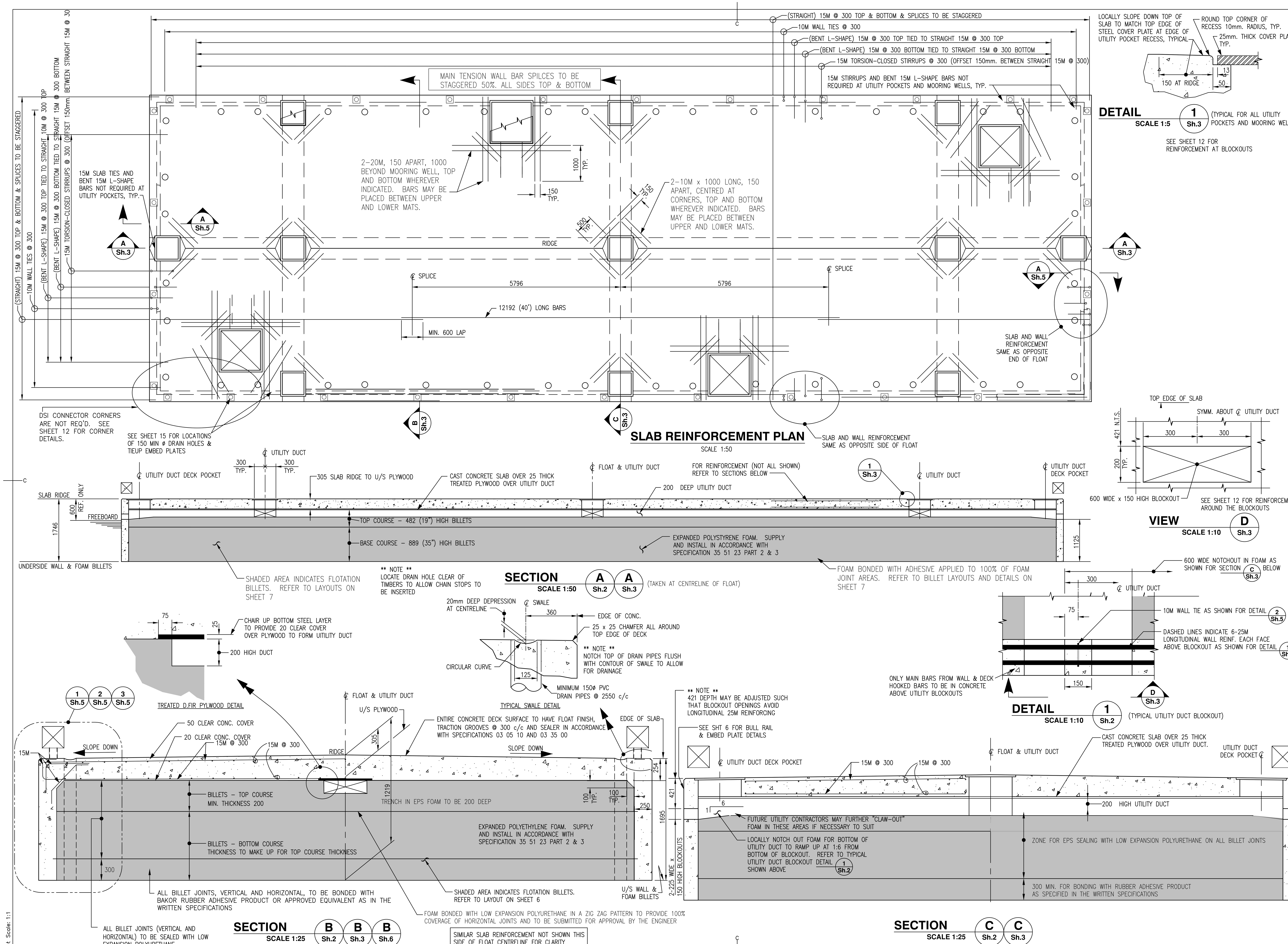
project / projet

FISHERIES AND OCEANS CANADA REAL PROPERTY , SAFETY AND SECURITY STANDARD CONCRETE FLOAT MODULE 26.22m x 8.537m

drawing / dessin

STANDARD FLOAT CONCRETE OUTLINE PLANS

designed GJG	concu
date 2019-03-27	
drawn EB	dessine
date 2019-03-27	
approved	approuve
date	
Tender	Soumission
PWGSC Project Manager	Administrateur de projets TPSGC
project number	no. du projet
TRNVHWY03002-13	
drawing no.	no. du dessin
56134 - 0801 - R8 - CONCRETE FLOAT - SHEET 2	



Public Works and Government Services Canada — Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada — Real Properties, Safety and Security

SCALE 1:50

TETRA TECH

revisions		date
0	ISSUED FOR TENDER	2019-03-27

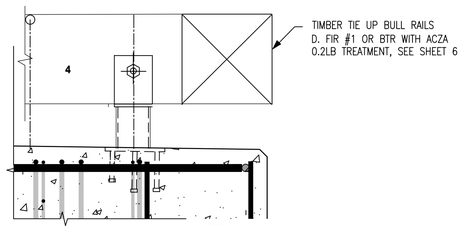
A detail no. / no. du detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

project / projet
FISHERIES AND OCEANS CANADA REAL PROPERTY, SAFETY AND SECURITY STANDARD CONCRETE FLOAT MODULE 26.22m x 8.537m

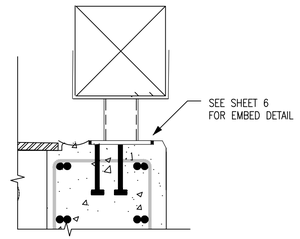
drawing / dessin
REINFORCEMENT FLOAT PLAN AND SECTIONS

designed / concu: GJG
date: 2019-03-27
drawn / dessine: EB
date: 2019-03-27
approved / approuve
date
Tender / Soumission
PWGSC Project Manager / Administrateur de projets TPSGC
project number / no. du projet: **TRNVHWY03002-13**
drawing no. / no. du dessin: **56134 - 0801 - R6 - CONCRETE FLOAT - SHEET 3**

Plot Scale: 1:1
PWGSC B1



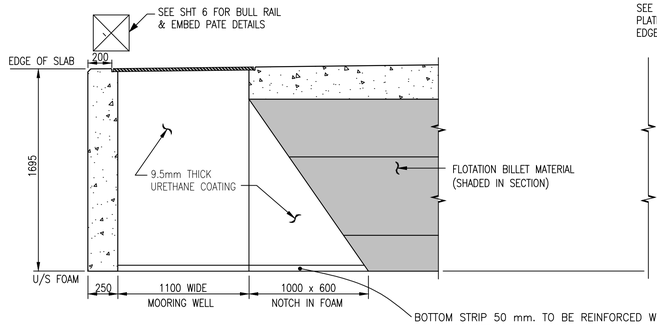
SECTION A — SCALE 1:10 — Sh.4



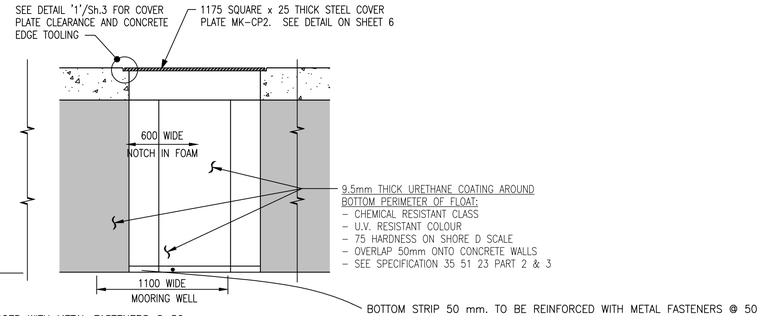
SECTION B — SCALE 1:10 — Sh.4

NOTES:

1. SEE WALL SECTIONS BELOW AND SHEET 12 FOR CORNER DETAILS.
2. SHEET 12 SHOWS TYPICAL LONG AND SHORT WALL DETAILS TO BE INCORPORATED WITH DETAILS ON THIS SHEET.

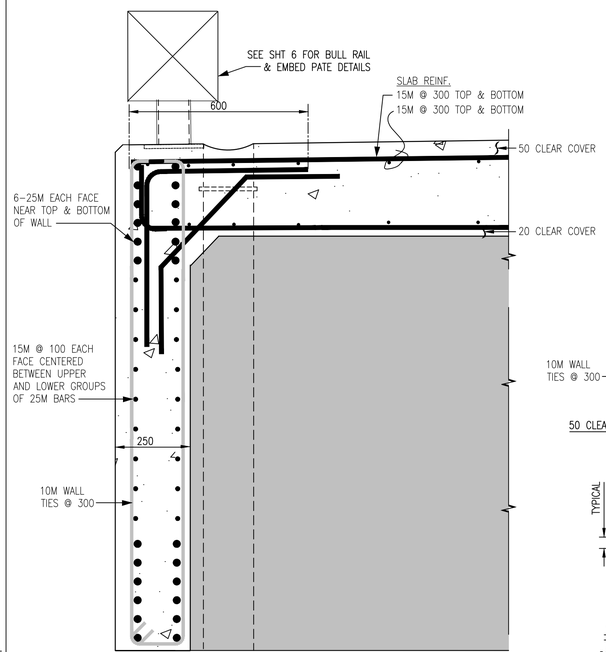


SECTION A — SCALE 1:25 — Sh.2 (TYPICAL AT ALL MOORING WELLS)

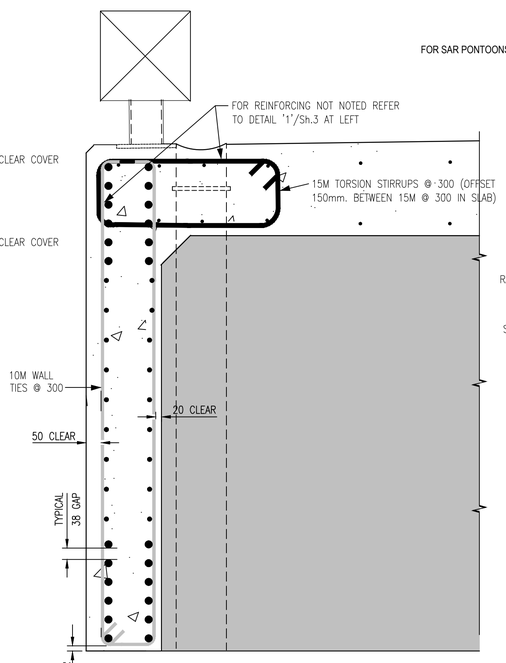


SECTION B — SCALE 1:25 — Sh.2 (TYPICAL AT ALL MOORING WELLS)

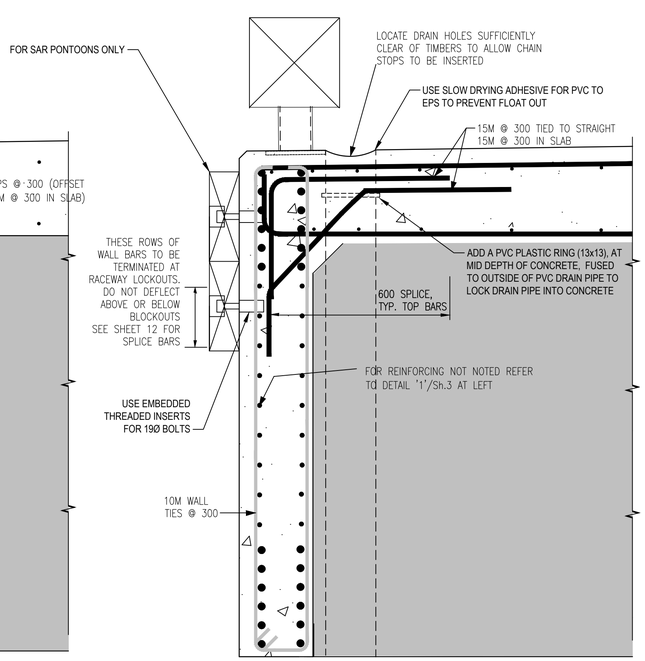
MAIN TENSION WALL BAR SPLICES TO BE STAGGERED 50%. ALL WALLS, TOP & BOTTOM DECK



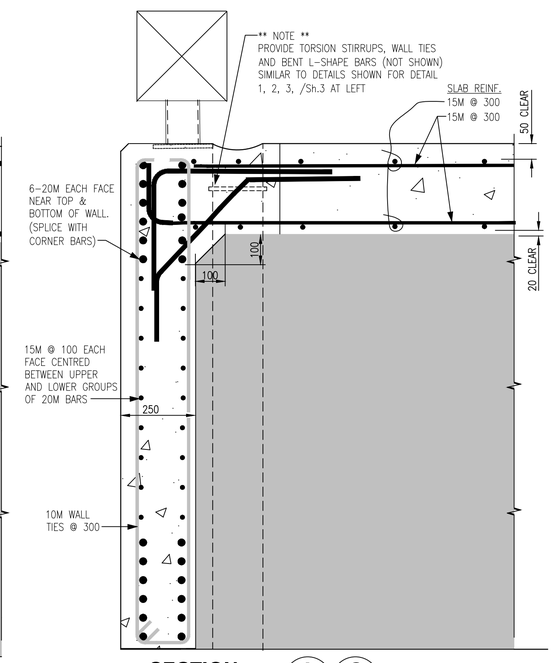
DETAIL 1 — SCALE 1:10 — Sh.3 (TYPICAL FOR LONG WALLS)



DETAIL 2 — SCALE 1:10 — Sh.3 (TYPICAL FOR LONG WALLS)



DETAIL 3 — SCALE 1:10 — Sh.3 (TYPICAL FOR LONG WALLS)



SECTION A C — SCALE 1:10 — Sh.3 Sh.2 (TYPICAL FOR SHORT WALLS OR END WALLS)

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TETRA TECH

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — GARY JOHN GAMMON — 11614 — 2019-04-11

0	ISSUED FOR TENDER	2019-03-27
revisions		date

A detail no. no. du detail
B location drawing no. sur dessin no.
C drawing no. dessin no.

project / projet

FISHERIES AND OCEANS CANADA REAL PROPERTY , SAFETY AND SECURITY STANDARD CONCRETE FLOAT

drawing / dessin

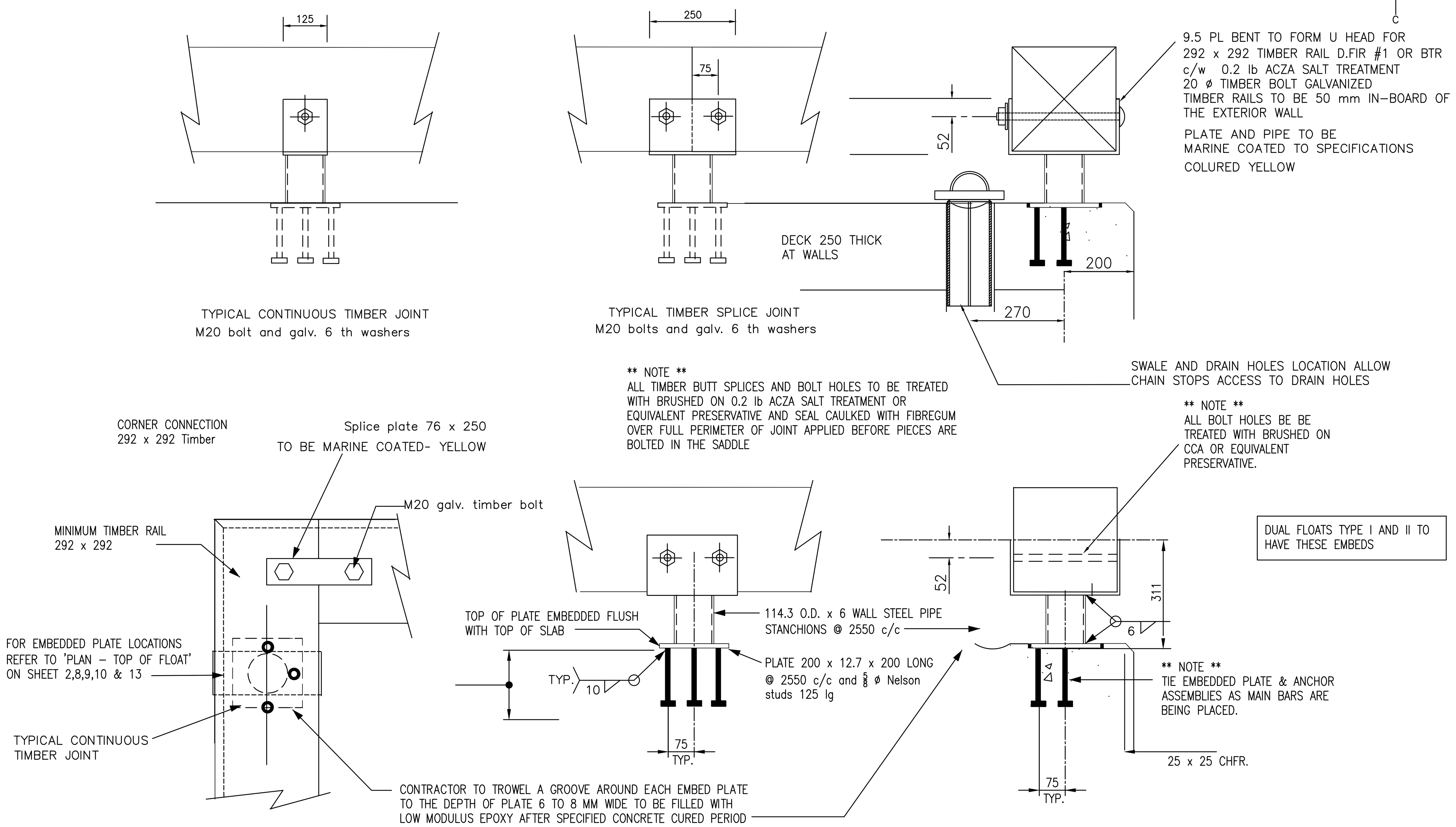
REINFORCEMENT AT FLOAT CORNERS AND WALL SECTIONS

designed GJG	concu
date 2019–03–27	
drawn EB	dessine
date 2019–03–27	
approved	approuve
date	
Tender	Soumission
PWGSC Project Manager	Administrateur de projets TPSGC
project number	no. du projet
TRNVHWY03002-13	
drawing no.	no. du dessin
56134 - 0801 - R6 - CONCRETE FLOAT - SHEET 5	

Plot Scale: 1:1

PWGSC B1

0 10 20mm 40 60 80 100 120 140 160 180 200mm



PLAN CORNER

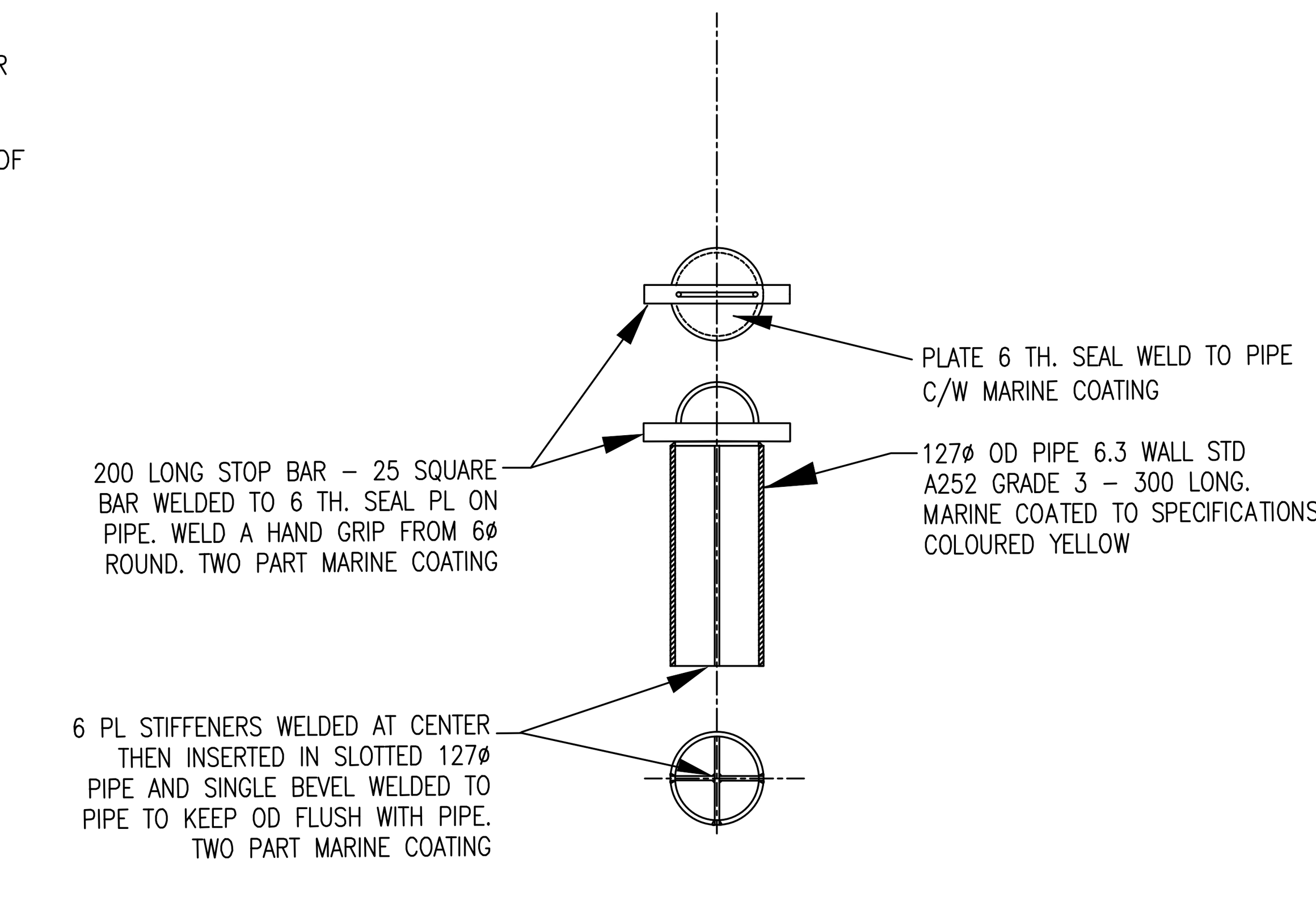
ELEVATION

SECTION

MARINE COATING IN ACCORDANCE WITH SPECIFICATION 09 92 19

TYPICAL BULL RAIL DETAILS FOR SCH SINGLE AND DUAL STANDARD FLOATS

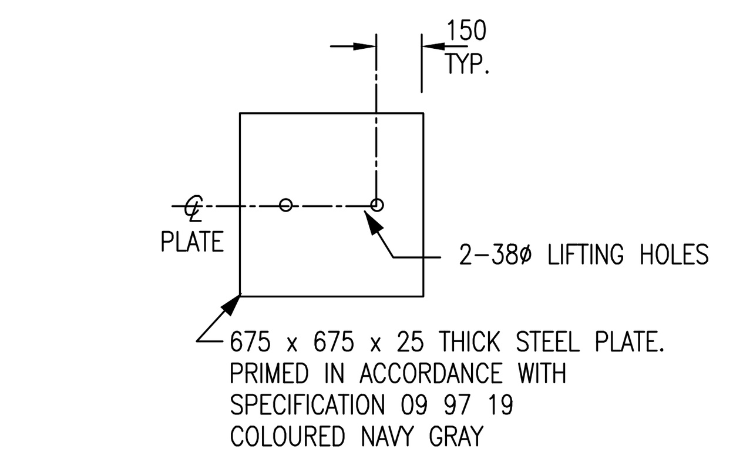
SCALE 1:10



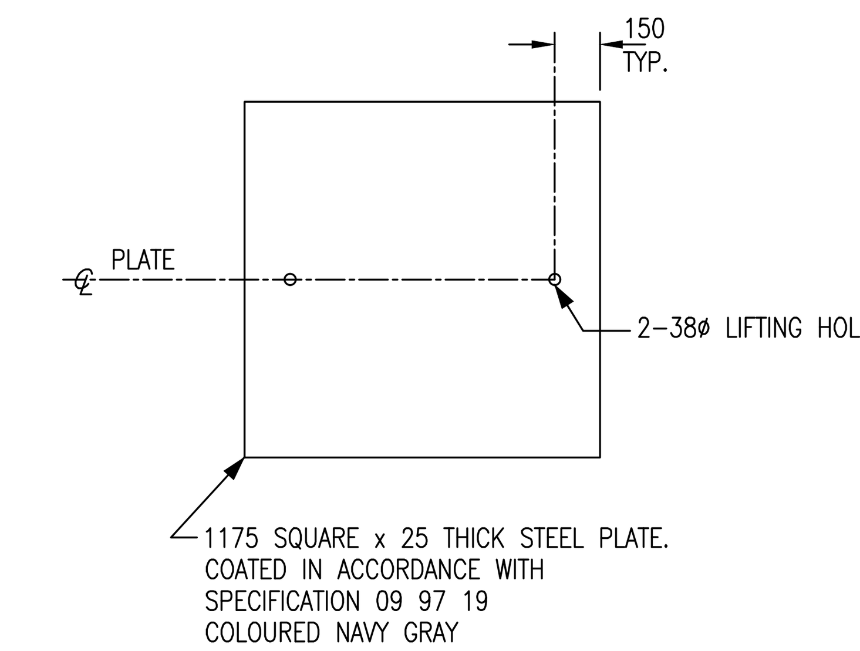
FENDER CHAIN STOP

PROVIDE 10 PER SINGLE FLOAT OR THE QUANTITY REQUIRED BY THE OWNER. NO CHAIN STOPS ARE REQUIRED FOR THE QUAD AND SAR FLOAT ON SHEET 22

N.I.C.



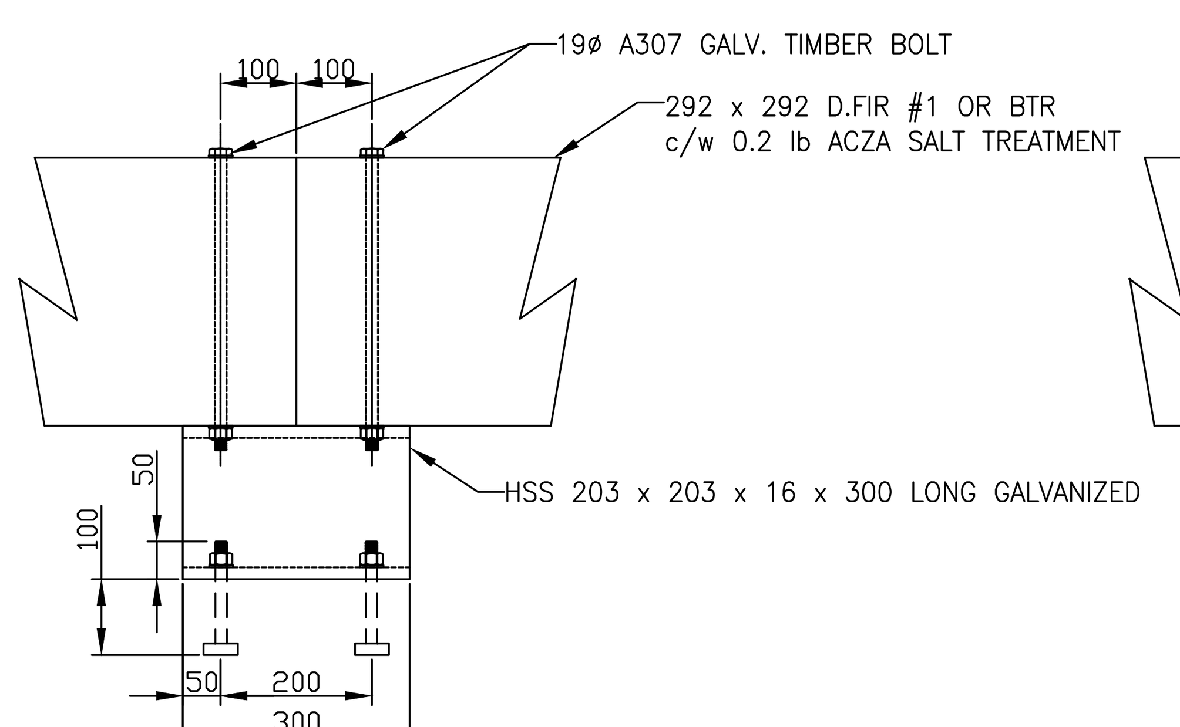
UTILITY STEEL COVER PLATES



MOORING WELL STEEL COVER PLATES

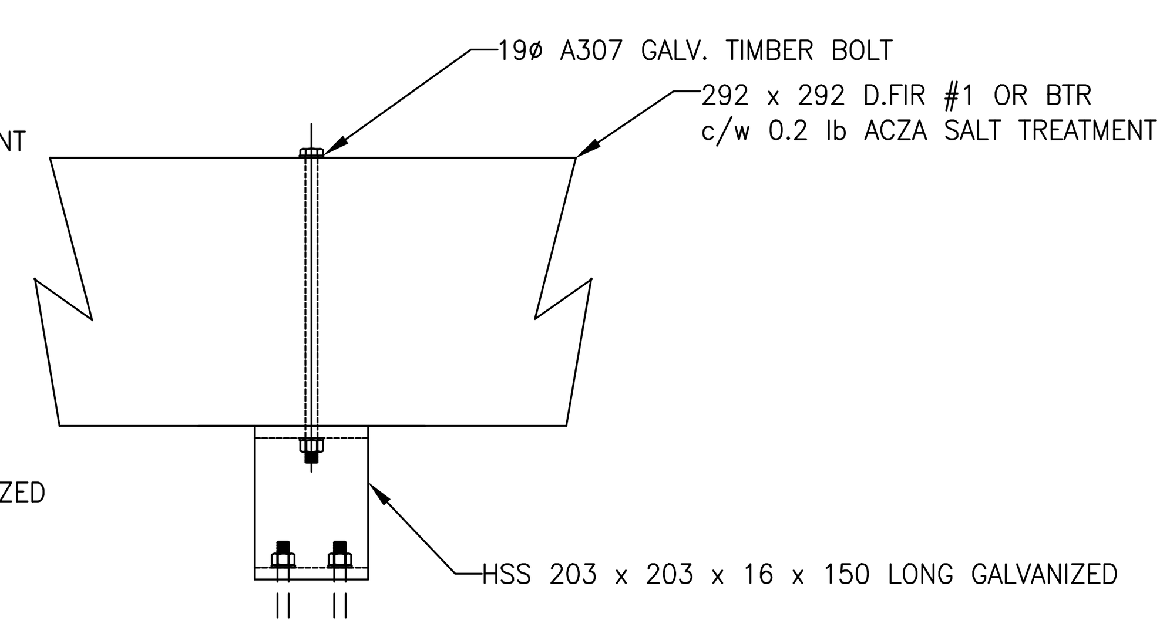
SCALE 1:25

NOTE:
SAR FLOAT TO HAVE THE SAME NON-SKID COATING ON THE STEEL HATCH AND WELL COVERS AS THE QUAD FLOAT.



TIMBER BUTT JOINT

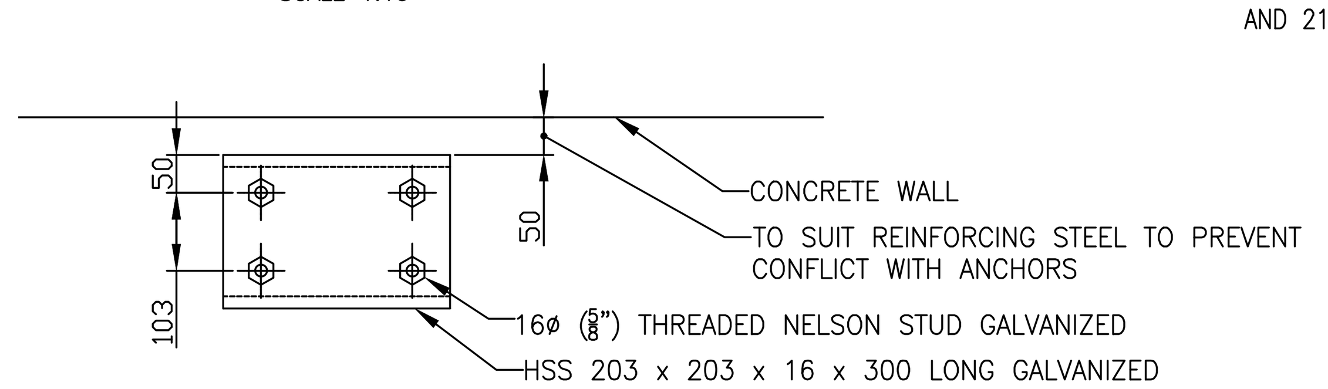
SCALE 1:10



SCH CONTINUOUS TIMBER BUTT JOINT

SCALE 1:10

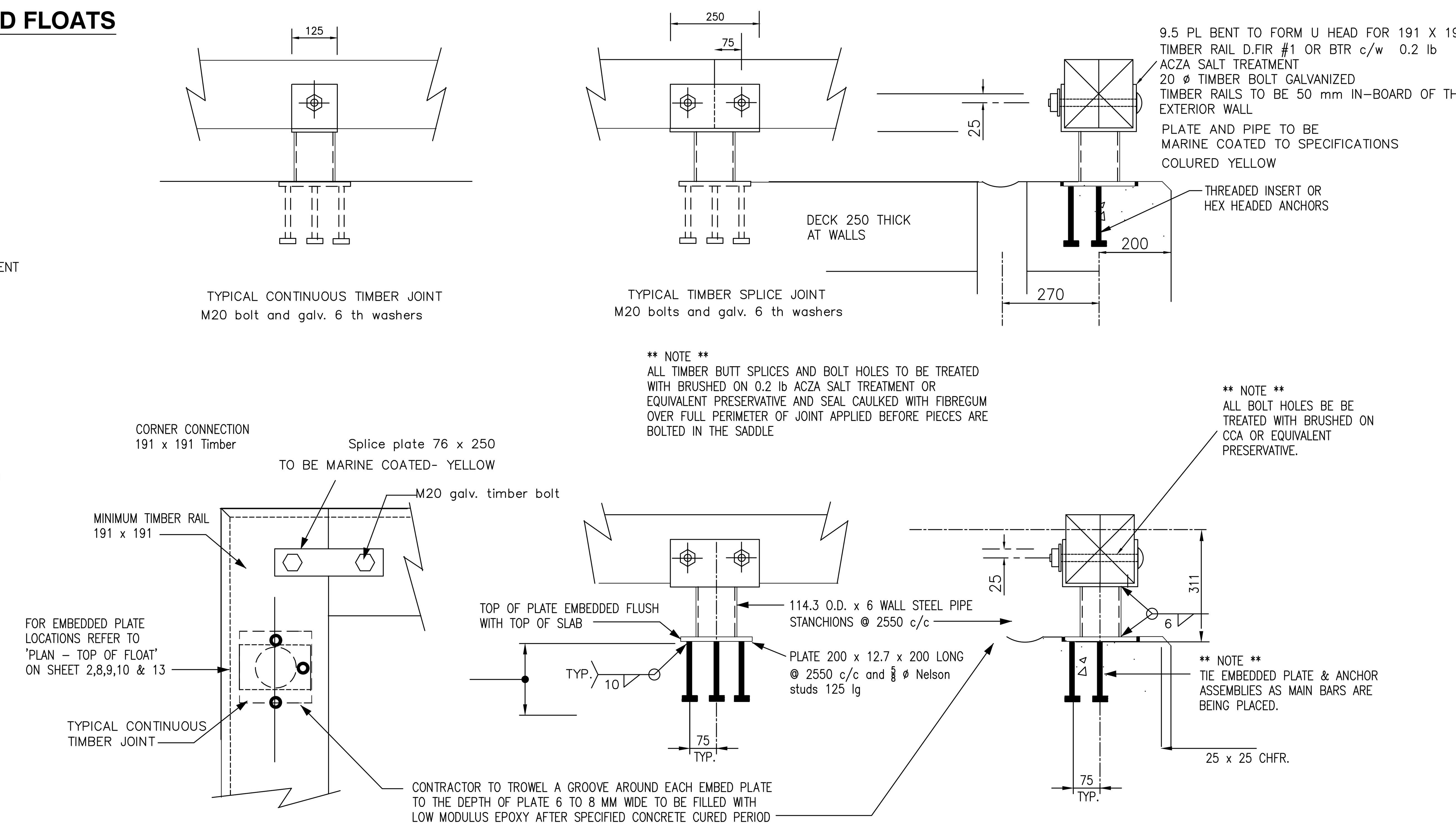
PROVIDE 32ø HOLES FOR NELSON STUDS AND 21ø HOLE FOR TIMBER BOLT.



PLAN

SCALE 1:10

TYPICAL BULL RAIL FOR SCH QUADS



PLAN CORNER

ELEVATION

SECTION

DUAL FLOATS TYPE I AND II TO HAVE THESE EMBEDS

MARINE COATING IN ACCORDANCE WITH SPECIFICATION 09 92 19

191x191 BULL RAIL DETAILS FOR SAR STANDARD FLOATS

SCALE 1:10

ALL PONTOONS IN THIS CONTRACT

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TETRA TECH

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — G.J. GAUDIN — 11614

revisions		date
0	ISSUED FOR TENDER	2019-03-27

A detail no. / no. du detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

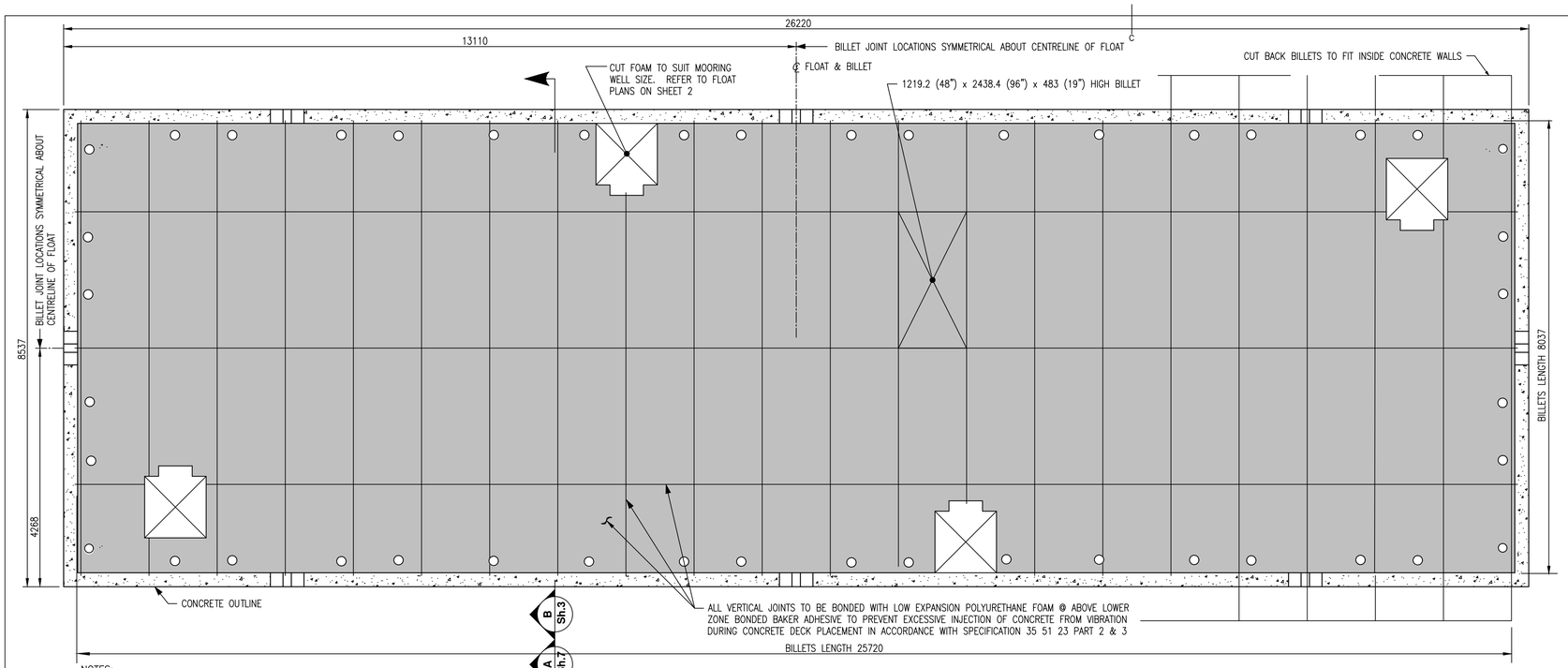
project / projet
FISHERIES AND OCEANS CANADA REAL PROPERTY , SAFETY AND SECURITY STANDARD CONCRETE FLOATS

drawing / dessin
DETAILS

designed / concu: GJG
date: 2019-03-27
drawn / dessine: EB
date: 2019-03-27
approved / approuve
date
Tender / Soumission
PWGSC Project Manager / Administrateur de projets TPSGC
project number / no. du projet: **TRNVHWY03002-13**
drawing no. / no. du dessin: **56134 - 0801 - R9 - CONCRETE FLOAT - SHEET 6**

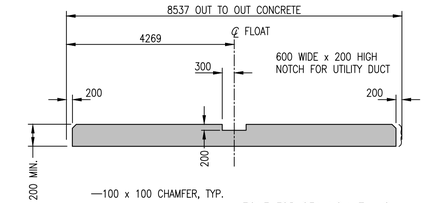
Plot Scale: 1:1

PWGSC B1



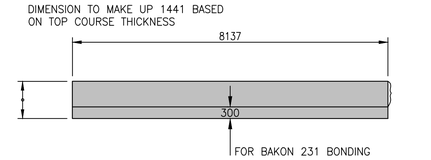
NOTES:
1. MIN. THICKNESS 200 mm.
2. ALL BILLETS BONDED VERTICALLY AND HORIZONTALLY WITH LOW EXPANSION POLYURETHANE. HORIZONTAL APPLICATION TO BE IN A ZIG ZAG PATTERN TO PROVIDE 100 % COVERAGE.
3. VERTICAL JOINTS SEALED WITH LOW EXPANSION POLYURETHANE INJECTED @ CENTERS OF 200 MAX. TO LOWEST HORIZONTAL JOINT.

PLAN - TOP COURSE



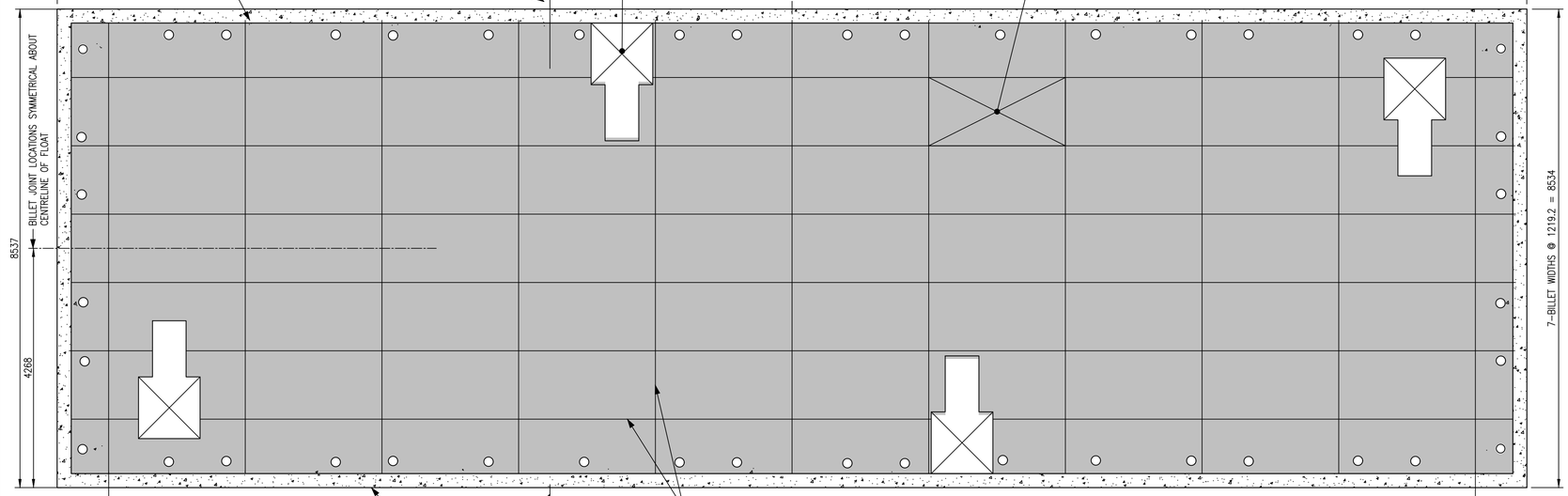
** NOTE **
CONCRETE WALLS AND DECK NOT SHOWN FOR CLARITY

SECTION A Sh.7 **SCALE 1:75** (TOP COURSE CROSS-SECTION)



** NOTE **
CONCRETE WALLS AND DECK NOT SHOWN FOR CLARITY

SECTION B Sh.7 **SCALE 1:75** (BASE COURSE CROSS-SECTION)



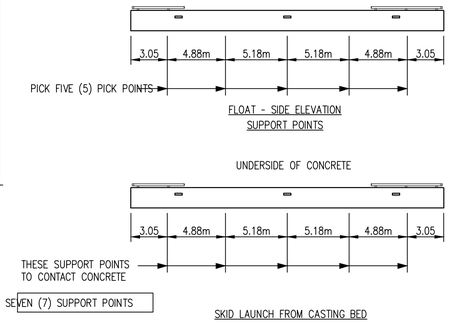
NOTES:
1. THICKNESS TO MAKE UP FOR THICKNESS OF TOP COURSE.
2. ALL VERTICAL AND HORIZONTAL BILLET JOINTS TO BE BONDED WITH RUBBER ADHESIVE, BAKOR 230-21 OR APPROVED EQUAL FOR LOWER 300 mm. FROM KEEL.
3. ALL BILLET JOINTS, VERTICAL AND HORIZONTAL, TO BE SEALED WITH LOW EXPANSION POLYURETHANE WITH APPROVED BONDING PATTERNS.

PLAN - BASE COURSE
FLOTATION BILLET LAYOUTS

SCALE 1:50

HOISTING GUIDELINES

1. CONCRETE COMPRESSIVE STRENGTH 35 MPa VERIFIED BY TEST CYLINDERS.
2. APPROXIMATE HOISTING WEIGHT WITH TIGHT CONTROL ON CONCRETE MIX PLASTIC DENSITY IS 235 TONS IMPERIAL.
3. NOTCH FOAM AS SHOWN AT SUPPORT POINT LOCATIONS.
4. MANUFACTURER MUST DESIGN AND SET EMBEDDED HOISTING ATTACHMENTS AND REINFORCING AND PROVIDE A DURABLE CORROSIVE RESISTANT SURFACE TO MATCH DESIGN. IN THE EVENT THE MANUFACTURER INTENDS TO USE EMBEDDED HOISTING ATTACHMENTS, THE MANUFACTURER SHALL DESIGN AND SUPPLY, INSTALL ATTACHMENTS, REINFORCING AND MAKE GOOD THE DECK SURFACE TO AN EQUIVALENT DURABLE CORROSIVE RESISTANT SURFACE AT HIS COST.
5. CONTRACTOR TO PROVIDE SUPPORT LATERAL SUPPORT FOR BOTTOM OF WALLS AT PICK POINTS TO PREVENT DAMAGE FROM EXCESSIVE DEFECTION OF THE WALL AS THE EPS DEFORMS. CONTRACTOR TO PROVIDE PROTECTION TO THE BOTTOM SURFACE OF THE CONCRETE AND EPS FOR SKID LAUNCH.



Plot Scale: 1:1

PWGSC B1

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TETRA TECH

PROFESSIONAL ENGINEER PROVINCE OF ONTARIO G. JOHN GAUDIN 11614 2019-04-11

0	ISSUED FOR TENDER	2019-03-27
revisions		date

A detail no. no. du detail
B location drawing no. sur dessin no.
C drawing no. dessin no.

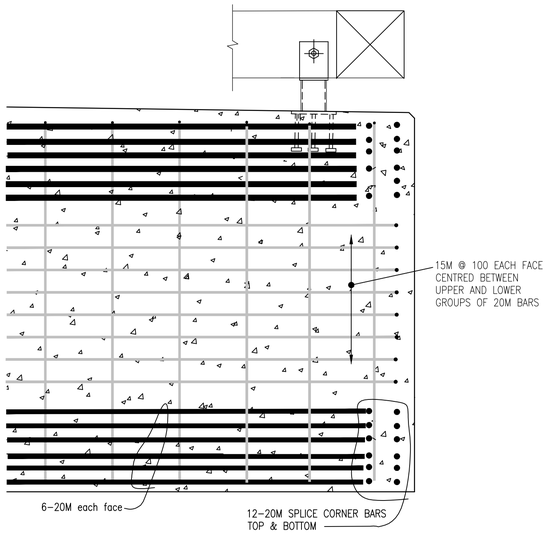
project / projet

FISHERIES AND OCEANS CANADA REAL PROPERTY , SAFETY AND SECURITY STANDARD CONCRETE FLOAT MODULE 26.22m x 8.537m

drawing / dessin

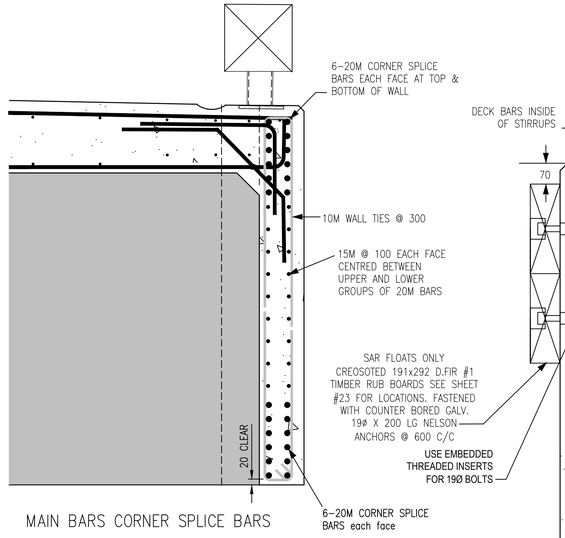
FLOTATION BILLET LAYOUTS AND HOISTING GUIDELINES Single Float

designed GJG	concu
date 2019-03-27	
drawn EB	dessine
date 2019-03-27	
approved	approuve
date	
Tender	Soumission
PWGSC Project Manager	Administrateur de projets TPSGC
project number	no. du projet
TRNVHWY03002-13	
drawing no.	no. du dessin
56134 - 0801 - R5 - CONCRETE FLOAT - SHEET 7	



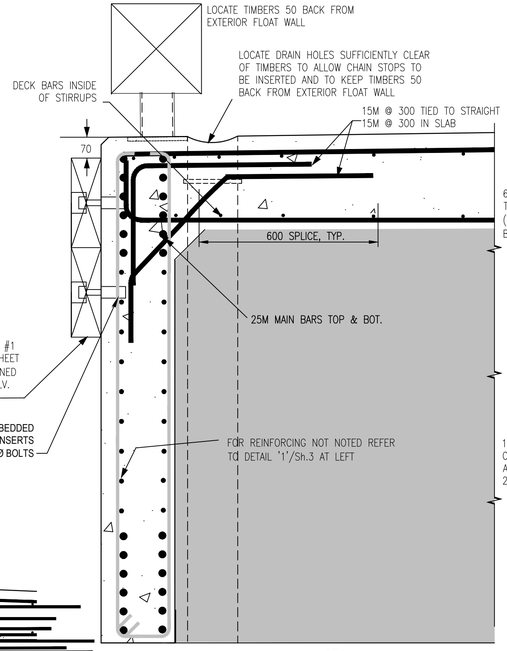
WALL REINFORCING AND CONCRETE AT CORNERS

TRANSVERSE WALL

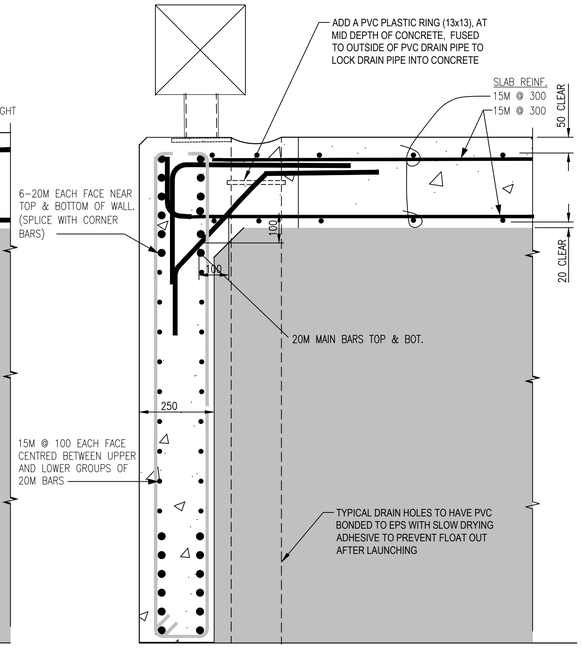


MAIN BARS CORNER SPLICE BARS

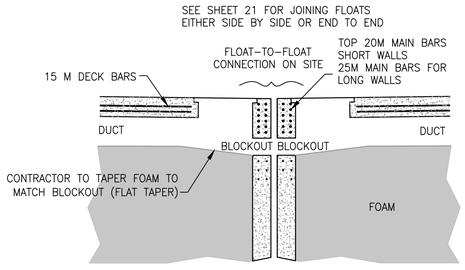
LONG WALL



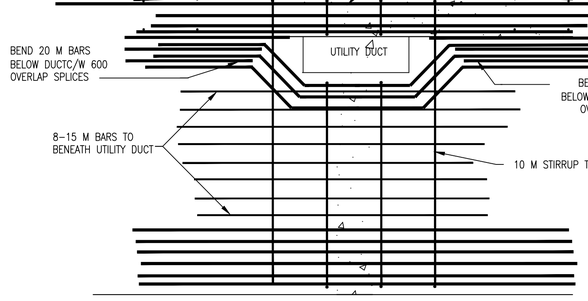
DETAIL SCALE 1:10 — 3 / Sh.3 (TYPICAL FOR LONG WALLS)



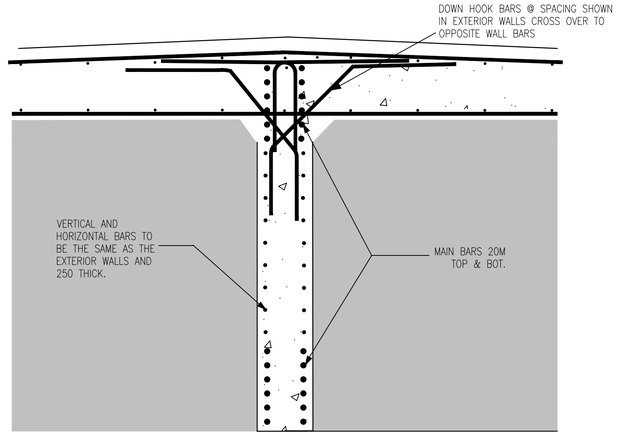
SECTION SCALE 1:10 — A / Sh.3, C / Sh.2 (TYPICAL FOR SHORT WALLS)



BLOCK OUT - EXTERIOR WALLS

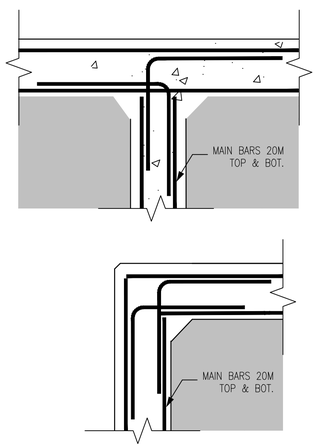


BLOCK OUTS THROUGH WALLS

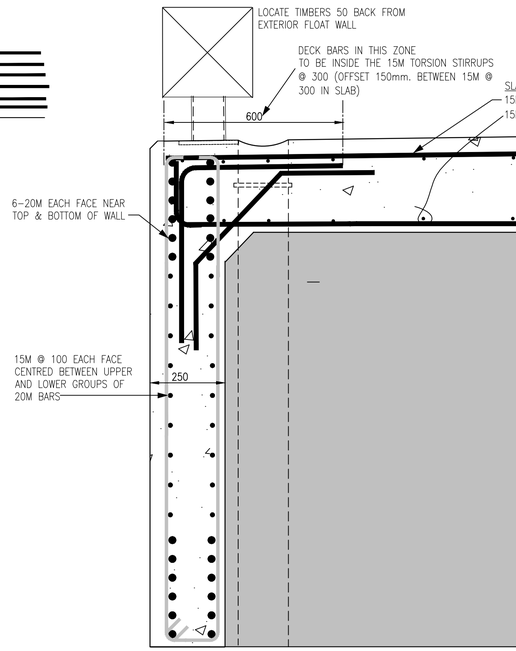


SECTION C / 13

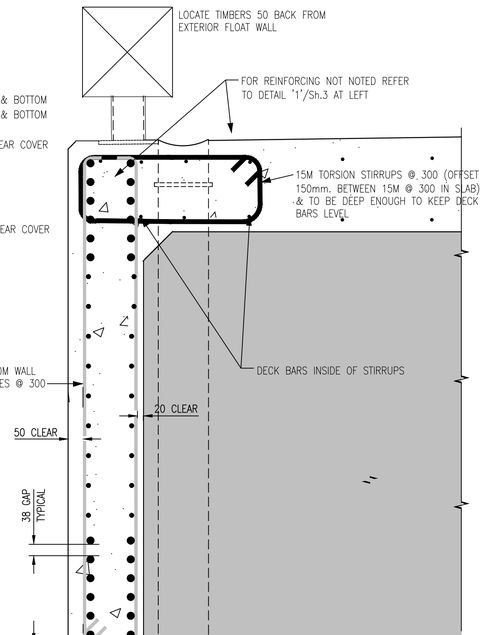
TYPICAL INTERIOR WALL REINFORCING BOTH LONG & TRANSVERSE WALLS



CORNER SPLICE BARS FOR MAIN BARS - PLAN



DETAIL SCALE 1:10 — 1 / Sh.3 (TYPICAL FOR LONG WALLS)



DETAIL SCALE 1:10 — 2 / Sh.3 (TYPICAL FOR LONG WALLS)

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TETRA TECH

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA GREGORY JOHN GAMDIN 11614 — 2019-04-11

0	ISSUED FOR TENDER	2019-03-27
revisions		date

A detail no. no. du detail
B location drawing no. sur dessin no.
C drawing no. dessin no.

project / projet

FISHERIES AND OCEANS CANADA REAL PROPERTY , SAFETY AND SECURITY STANDARD CONCRETE FLOAT MODULE 26.22m x 8.537m

drawing / dessin

FLOAT WITHOUT CONNECTION POCKETS AT THE CORNERS

designed	GJG	concu
date	2019-03-27	
drawn	EB	dessine
date	2019-03-27	
approved		approuve
date		
Tender		Soumission
PWGSC Project Manager		Administrateur de projets TPSGC

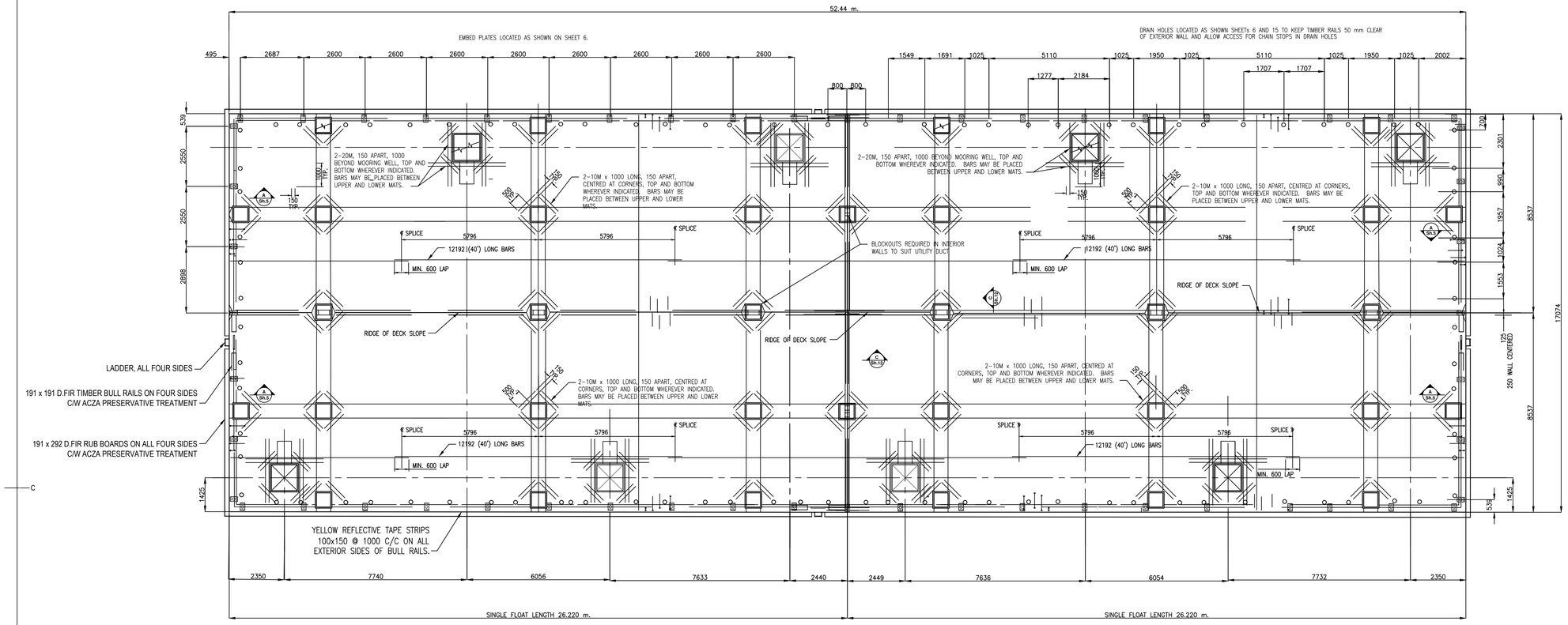
project number / no. du projet: **TRNVHWY03002-13**

drawing no. / no. du dessin: **56134 - 0801 - R5 - CONCRETE FLOAT - SHEET 12**

Plot Scale: 1:1

PWGSC B1

0 10 20mm 40 60 80 100 120 140 160 180 200mm



NOTES :

1. FOAM BONDING TO BOND THE BOTTOM 300 ZONE OF EACH BILLET WITH BAKOR 231 RUBBER ADHESIVE BY PLANING OR TRIMMING JUST SUFFICIENTLY TO MAKE CONTACT WITH THE BAKOR ADHESIVE, THE UPPER ZONE OF EPS ABOVE 300 FROM KEEL MAY BE BONDED WITH LOW EXPANSION POLYURETHANE FOAM OR BAKOR 231.
2. BULL RAILS 191x191 C/W YELLOW REFLECTIVE TAPE STRIPS 100x150 @ 1000 C/C ON ALL EXTERIOR SIDES OF BULL RAILS.

PLAN - QUAD TYPE II - STAGGERED WELLS - FOUR STD'S

STANDARD QUAD DETAILS TO BE USED WITH SHEET 31 FOR SAR DOCK FLOAT AND WITH SHEET 32 FOR THE BREAKWATER FLOAT EXCEPT FOR DETAILS SHOWN ON SHEETS 31, 32, AND 33.

SEE ALL OTHER SHEETS FOR DETAILS FOR UTILITY CHASES AND SHEET 6 FOR TIMBER RAIL AND EMBED PLATE DETAILS & LOCATIONS INCLUDING DRAIN HOLES. TIMBER RAILS HAVE BEEN SHIFTED TO KEEP OUTSIDE FACE OF TIMBER 50mm CLEAR OF EXTERIOR WALLS.

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TENDER PACKAGE I

TETRA TECH

PROFESSIONAL ENGINEER PROVINCE OF NEWFOUNDLAND AND LABRADOR GREGORY JOHN JOSEPH 11614 2019-04-11

revisions		date
0	ISSUED FOR TENDER	2019-03-27

A detail no. no. du detail
B location drawing no. sur dessin no.
C drawing no. dessin no.

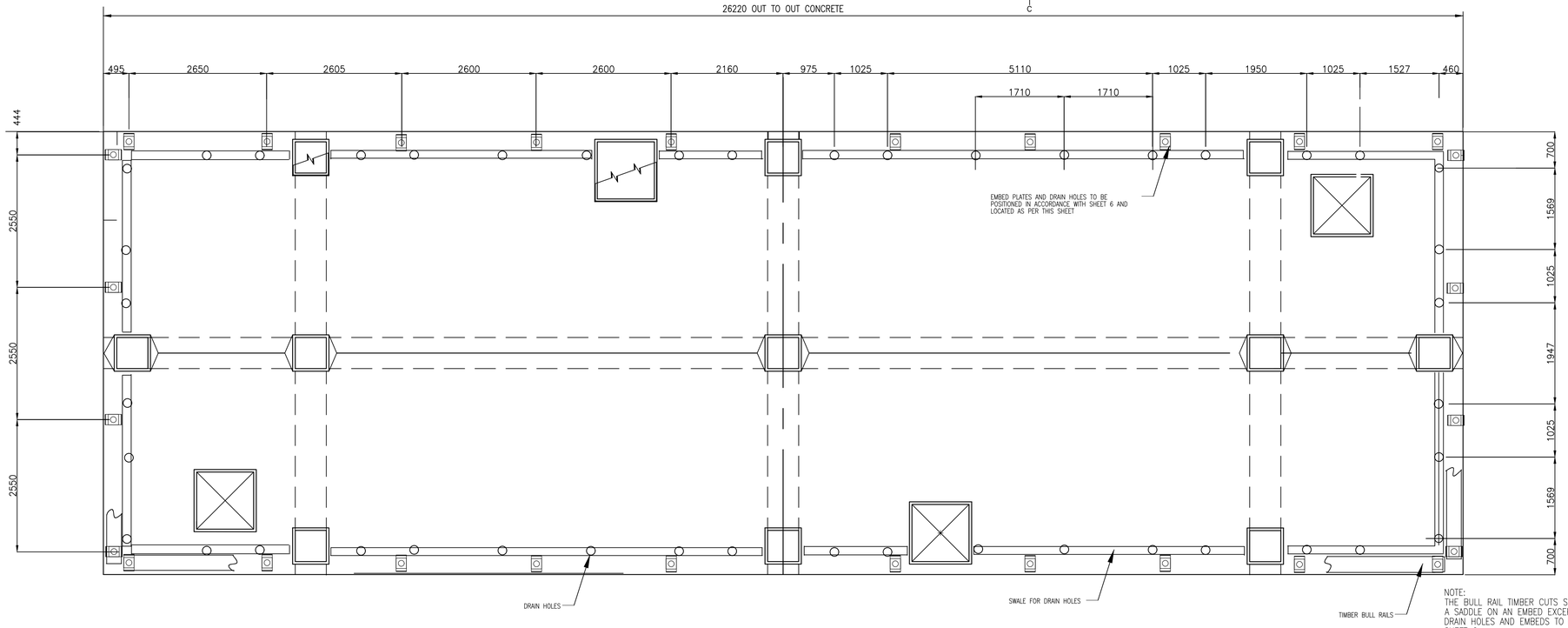
project / projet
FISHERIES AND OCEANS CANADA REAL PROPERTY , SAFETY AND SECURITY QUAD CONCRETE FLOAT MODULE 52.44 m x 17.074m

drawing / dessin
PLAN VIEW LAYOUT CONCRETE OUTLINE

Quad TYPE II - Staggered Wells

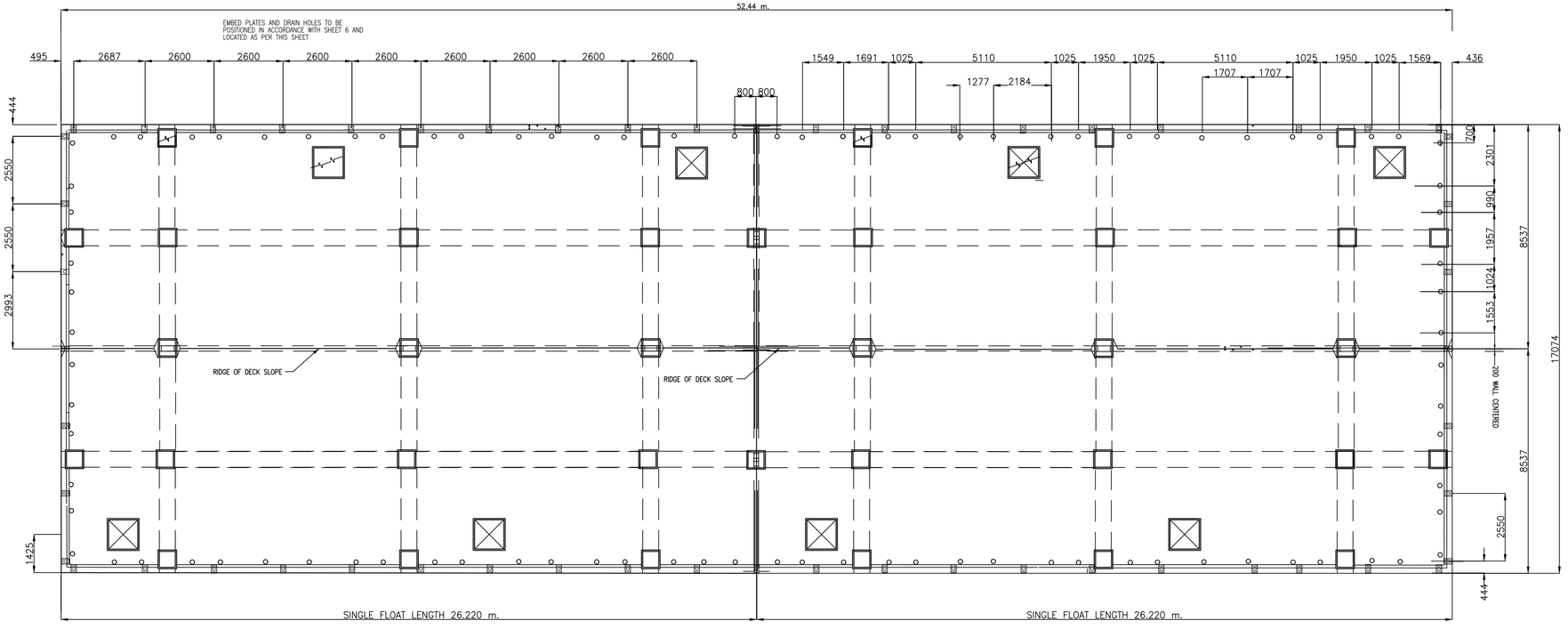
designed GJG	concu
date 2019–03–27	
drawn EB	dessine
date 2019–03–27	
approved	approuve
date	
Tender	Soumission
PWGSC Project Manager	Administrateur de projets TPSGC
project number	no. du projet
TRN.VHWY03002-01	
drawing no.	no. du dessin
56134 - 0801 - R7 - CONCRETE FLOAT - SHEET 13	

Plot Scale: 1:1
PWGSC B1
0 10 20mm 40 60 80 100 120 140 160 180 200mm



SINGLE FLOAT

NOTE:
THE BULL RAIL TIMBER CUTS SHALL BE BUTT SPLICED IN A SADDLE ON AN EMBED EXCEPT AT THE CORNERS.
DRAIN HOLES AND EMBEDS TO BE POSTIONED FROM EXTERIOR WALLS AS SHOWN ON SHEET 6.



OVERALL LENGTH 26.22 METRES TIMES TWO = 52.44 METRES

QUAD TYPE I&II

GENERAL GUIDELINES FOR EMBED SPACING AND DESIGN HOLES. SEE SHTS 31 AND 32 FOR CONFLICTS WITH DRAIN HOLES AND EMBEDS.

Plot Scale: 1:1
PWGSC B1

0 10 20mm 40 60 80 100 120 140 160 180 200mm

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TETRA TECH

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA GARY JOHN GAMDIN 11614 2019-04-11

0	ISSUED FOR TENDER	2019-03-27
revisions		date

A detail no. no. du detail
B location drawing no. sur dessin no.
C drawing no. dessin no.

project / projet

FISHERIES AND OCEANS CANADA REAL PROPERTY , SAFETY AND SECURITY STANDARD CONCRETE FLOAT MODULE 26.22 m x 8.537m

drawing / dessin

LOCATION OF DRAIN HOLES & EMBEDS - STD

designed	GJG	concu
date	2019-03-27	
drawn	EB	dessine
date	2019-03-27	
approved		approuve
date		
Tender		Soumission
PWGSC Project Manager		Administrateur de projets TPSGC

project number / no. du projet

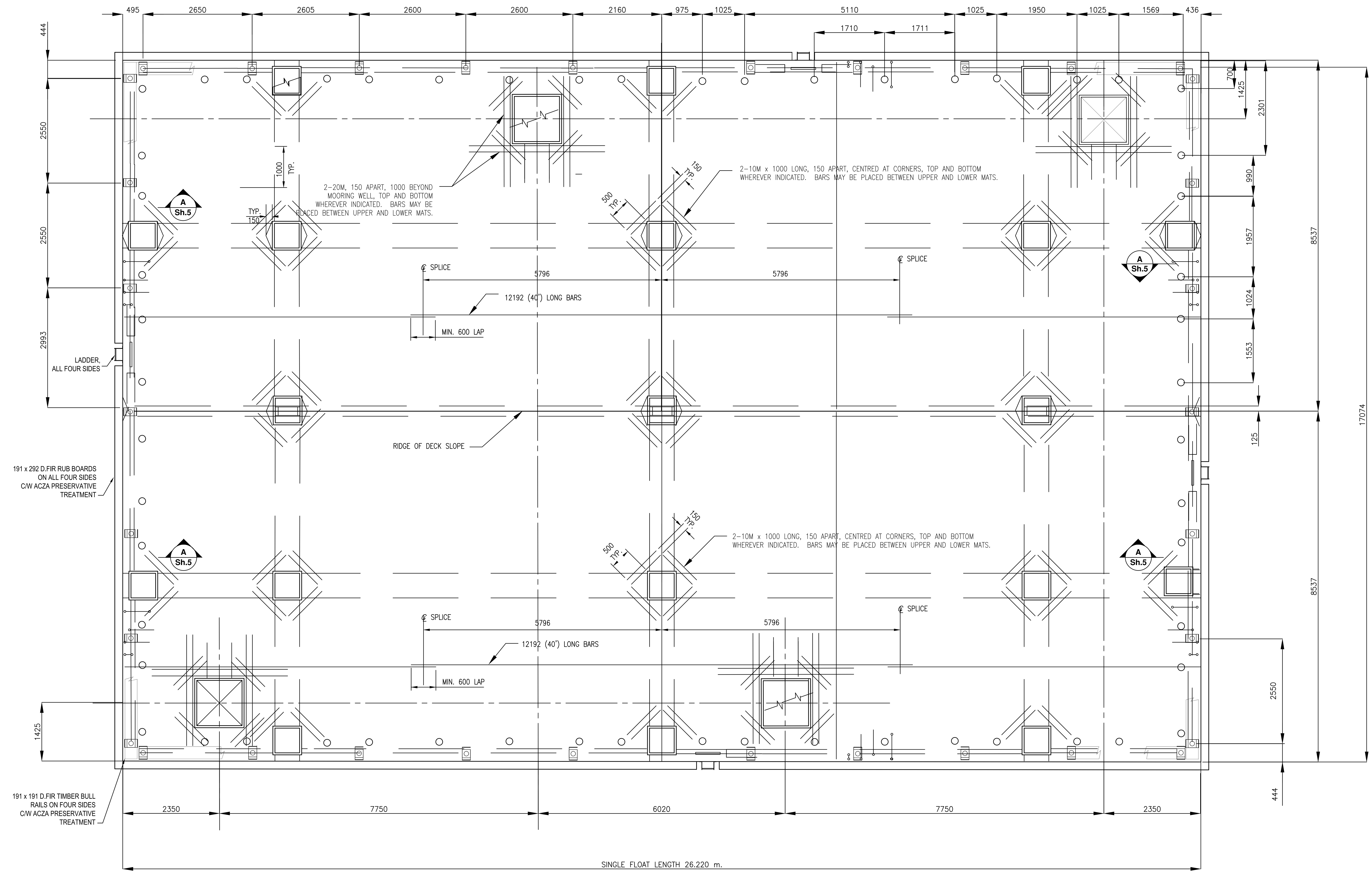
TRN.VHWY03002-13

drawing no. / no. du dessin

56134 - 0801 - CONCRETE FLOAT - SHEET 15

NOTES :

1. ADD BULL RAILS 191x191 C/W YELLOW REFLECTIVE TAPE STRIPS 100x150 @ 1000 C/C ON ALL EXTERIOR SIDES OF BULL RAILS.



PLAN -DUAL TYPE II - SIDE BY SIDE- STAGGERED WELLS

Plot Scale: 1:1

PWGSC B1

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada / Real Properties, Safety and Security

TETRA TECH

0	ISSUED FOR TENDER	2019-03-27
revisions		date

A detail no. / no. du detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

project / projet

FISHERIES AND OCEANS CANADA REAL PROPERTY , SAFETY AND SECURITY

drawing / dessin

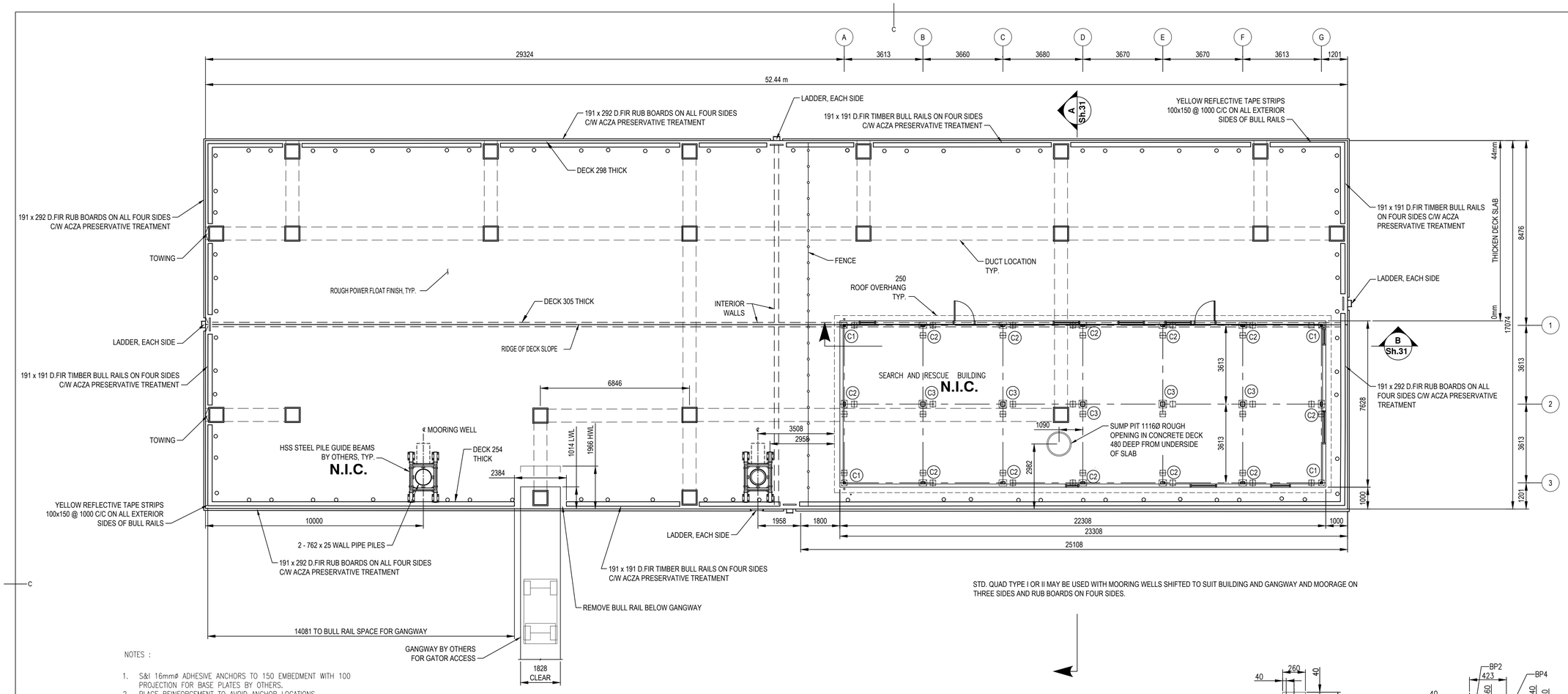
PLAN VIEW LAYOUT CONCRETE OUTLINE

DUAL TYPE II - STD FLOATS SIDE BY SIDE

designed GJG / concu
date 2019-03-27
drawn EB / dessine
date 2019-03-27
approved / approuve
date
Tender / Soumission
PWGSC Project Manager / Administrateur de projets TPSGC

project number / no. du projet
TRN.VHWY03002-01

drawing no. / no. du dessin
56134 - 0801 - R0 - CONCRETE FLOAT - SHEET 18



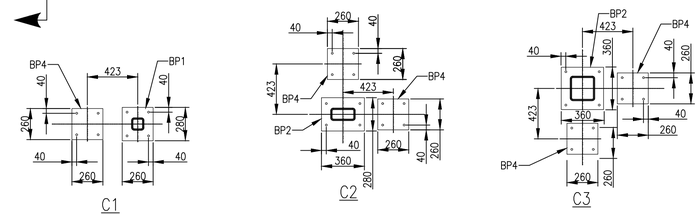
NOTES :

1. S&I 16mmø ADHESIVE ANCHORS TO 150 EMBEDMENT WITH 100 PROJECTION FOR BASE PLATES BY OTHERS.
2. PLACE REINFORCEMENT TO AVOID ANCHOR LOCATIONS.

PLAN - STANDARD QUAD TO BE MODIFIED AS SHOWN

SCALE 1:100

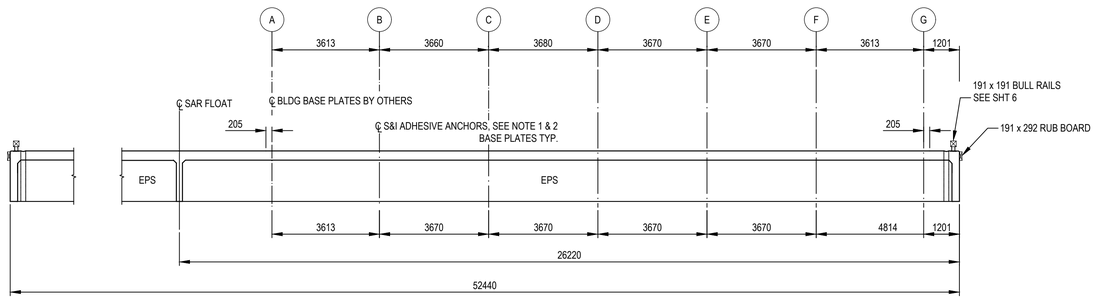
STD. QUAD TYPE I OR II MAY BE USED WITH MOORING WELLS SHIFTED TO SUIT BUILDING AND GANGWAY AND MOORAGE ON THREE SIDES AND RUB BOARDS ON FOUR SIDES.



BASE PLATES PLANS (BY OTHERS)

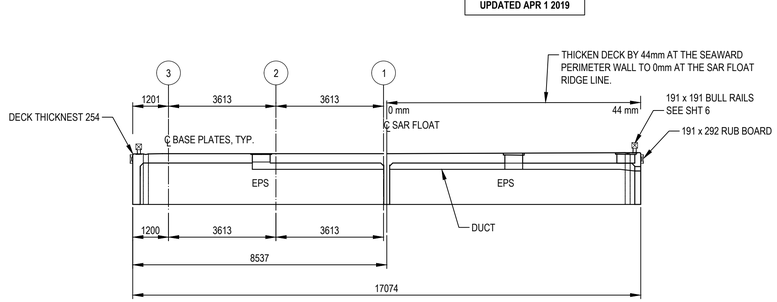
N.I.C.

BASE PLATE DIMENSIONS UPDATED APR 1 2019



SECTION B

SCALE 1:100 — SH 31



SECTION A

SCALE 1:100 — SH 31

SEE ALL OTHER SHEETS FOR DETAILS FOR UTILITY CHASES AND SHEET 6 FOR TIMBER RAIL AND EMBED PLATE DETAILS & LOCATIONS INCLUDING DRAIN HOLES. TIMBER RAILS HAVE BEEN SHIFTED TO KEEP OUTSIDE FACE OF TIMBER 50 mm CLEAR OF EXTERIOR WALLS.

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TETRA TECH

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA GREGORY JOHN GAMDIN 11614 2019-04-11

revisions		date
0	ISSUED FOR TENDER	2019-03-27

A detail no. no. du detail
B location drawing no. sur dessin no.
C drawing no. dessin no.

project / projet

FISHERIES AND OCEANS CANADA
CANADIAN COAST GUARD
SEARCH AND RESCUE

drawing / dessin

HARTLEY BAY
SEARCH AND RESCUE
PONTOON

designed	GJG
date	2019–03–27
drawn	EB
date	2019–03–27
approved	
date	
Tender	
PWGSC Project Manager	

project number / no. du projet

TRNVHWY03002-13

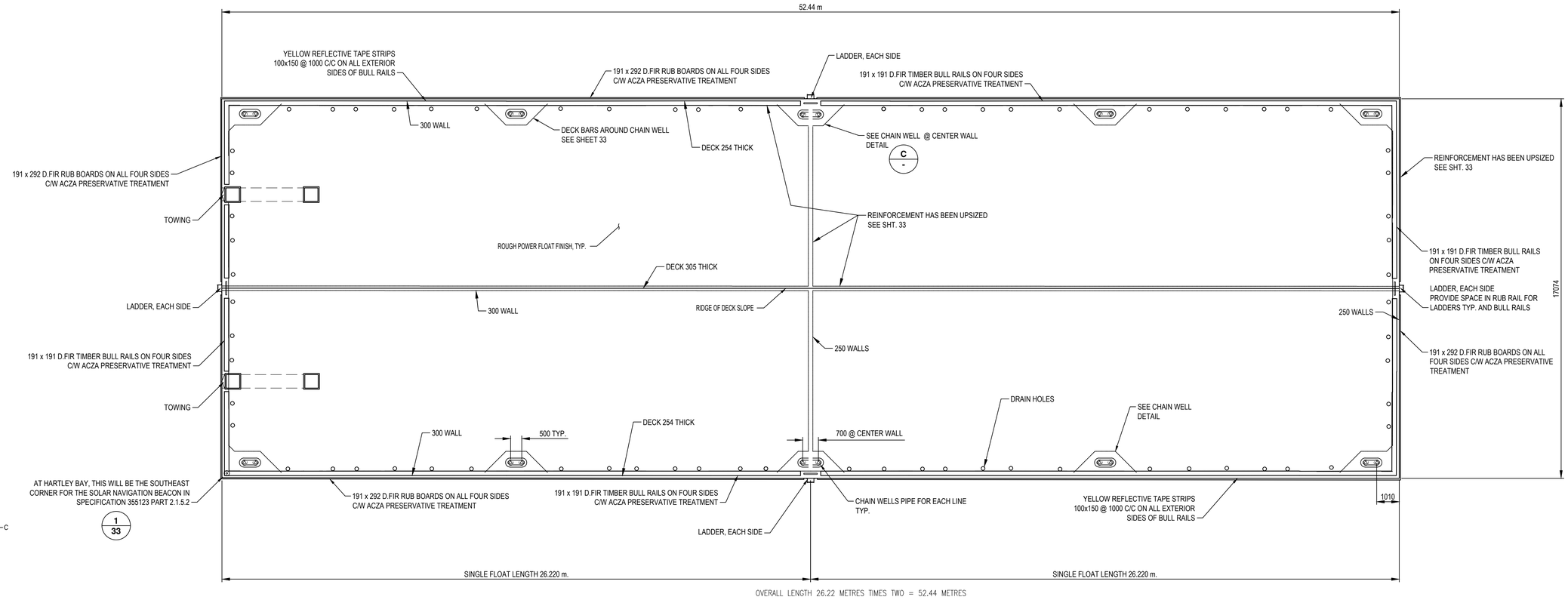
drawing no. / no. du dessin

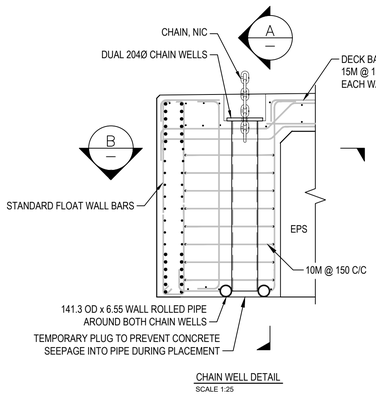
56134 - 0801 - R1 - CONCRETE FLOAT - SHEET 31

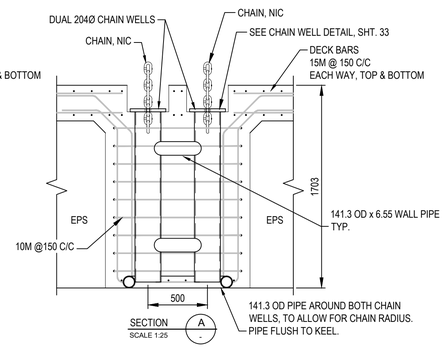
Plot Scale: 1:1

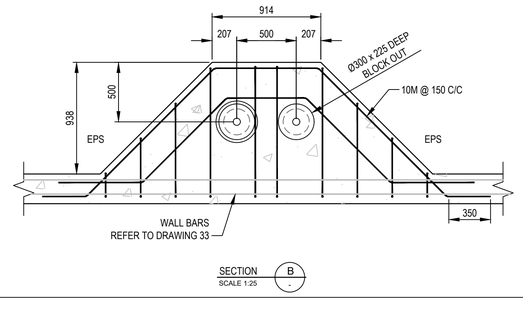
PWGSC B1

0 10 20mm 40 60 80 100 120 140 160 180 200mm



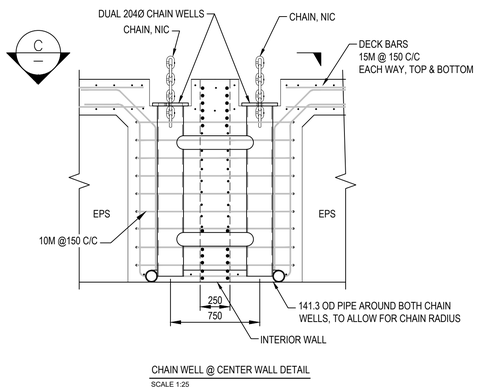


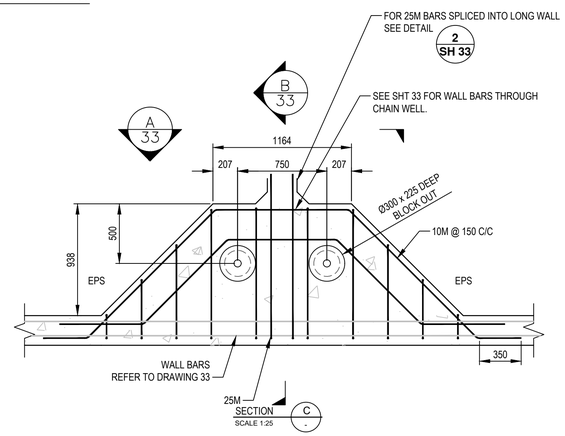




PLAN - STANDARD QUAD TYPE II MODIFIED WITH CHAIN WELLS

SCALE 1:100





SEE ALL OTHER SHEETS FOR DETAILS FOR UTILITY CHASES AND SHEET 6 FOR TIMBER RAIL AND EMBED PLATE DETAILS & LOCATIONS INCLUDING DRAIN HOLES. TIMBER RAILS HAVE BEEN SHIFTED TO KEEP TIMBER 50 mm CLEAR OF EXTERIOR WALLS.

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TETRA TECH

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA GARY JOHN JOHNSON 11614 2019-04-11

0	ISSUED FOR TENDER	2019-03-27
revisions		date

A detail no. no. du detail
B location drawing no. sur dessin no.
C drawing no. dessin no.

project / projet

FISHERIES AND OCEANS CANADA
CANADIAN COAST GUARD
SEARCH AND RESCUE

drawing / dessin

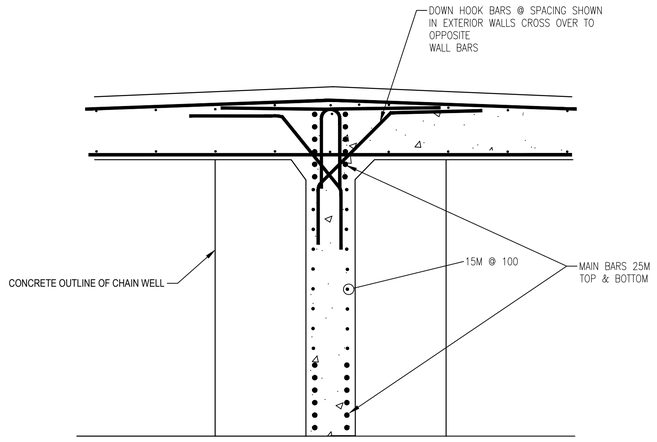
HARTLEY BAY BREAKWATER QUAD PONTOON

designed GJG	concu
date 2019-03-27	
drawn EB	dessine
date 2019-03-27	
approved	approuve
date	
Tender	Soumission
PWGSC Project Manager	Administrateur de projets TPSGC

project number / no. du projet
TRNVHWY03002-13

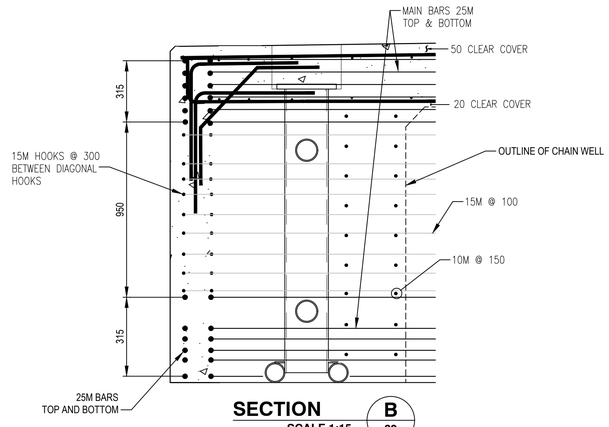
drawing no. / no. du dessin
56134 - 0801 - R1 - CONCRETE FLOAT - SHEET 32

Plot Scale: 1:1
PWGSC B1
0 10 20mm 40 60 80 100 120 140 160 180 200mm



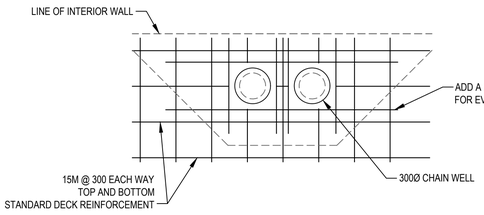
SECTION A (SCALE 1:15) — 32

INTERIOR TRANSVERSE WALL @ CHAIN WELL

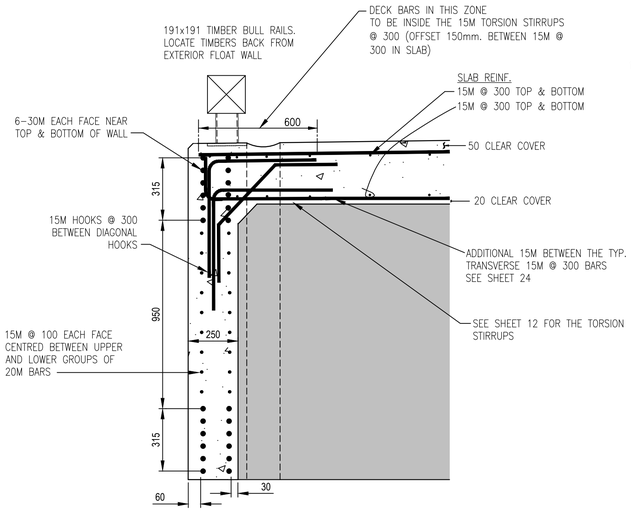


SECTION B (SCALE 1:15) — 32

END TRANSVERSE WALL @ CHAIN WELL

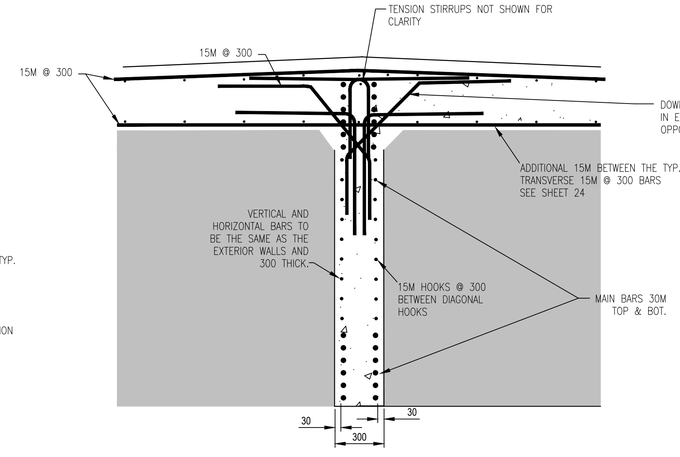


DECK BARS @ CHAIN WELL



DETAIL 1 (SCALE 1:25) — Sh.3

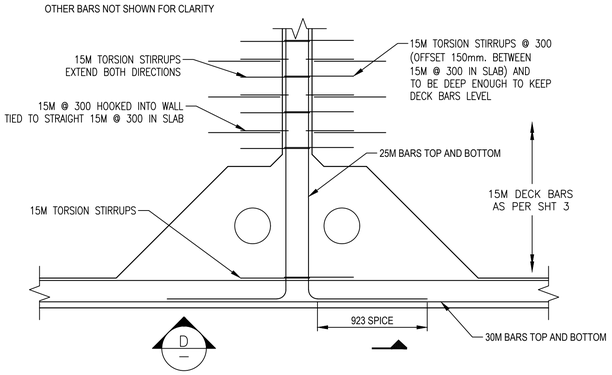
(TYPICAL FOR LONG WALLS)
SEE SHT 12 FOR TORSIONAL STURRUP



SECTION C (SCALE 1:15) — 13

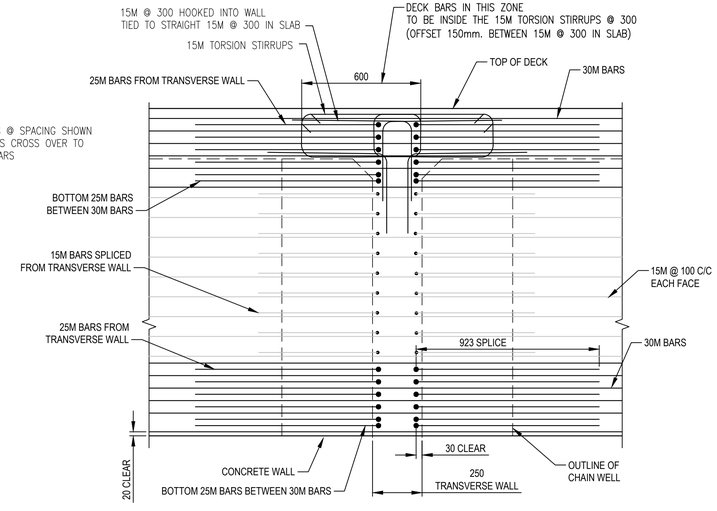
TYPICAL INTERIOR WALL REINFORCING LONG WALL

SEE SHT 12 FOR SHORT WALLS



DETAIL 2 (SCALE 1:25) — Sh.32

TRANSVERSE WALL MAIN BARS SPLICED INTO LONG WALL



SECTION D (SCALE 1:15) — -

OTHER REINFORCEMENT NOT SHOWN FOR CLARITY

Public Works and Government Services Canada / Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada
Real Properties, Safety and Security

TETRA TECH

PROFESSIONAL ENGINEER — PROVINCE OF NEWFOUNDLAND AND LABRADOR — GARY JOHN GREGORY JOHNSON — 11614 — 2019-04-11

revisions		date
0	ISSUED FOR TENDER	2019-03-27

A detail no. no. du detail
B location drawing no. sur dessin no.
C drawing no. dessin no.

project / projet

FISHERIES AND OCEANS CANADA
CANADIAN COAST GUARD
SEARCH AND RESCUE

drawing / dessin

HARTLEY BAY
SAR AND BREAKWATER
PONTOON DETAILS

designed	GJG	concu
date	2019-03-27	
drawn	EB	dessine
date	2019-03-27	
approved		approuve
date		
Tender		Soumission
PWGSC Project Manager		Administrateur de projets TPSGC

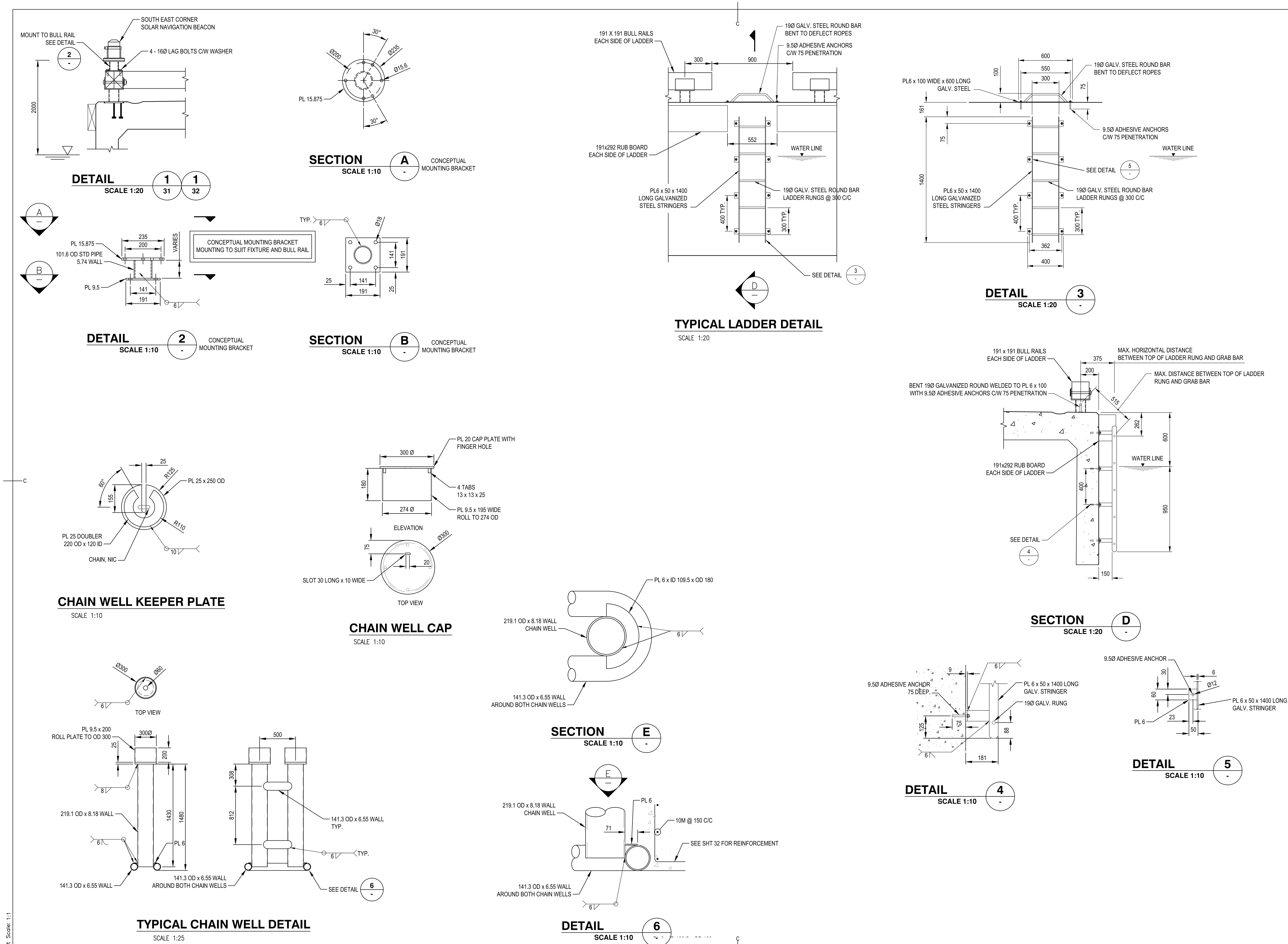
project number / no. du projet: **TRNVHWY03002-13**

drawing no. / no. du dessin: **56134 - 0801 - R1 - HB DETAILS - SHEET 33**

Plot Scale: 1:1

PWGSC B1

0 10 20mm 40 60 80 100 120 140 160 180 200mm



Public Works and Government Services Canada — Travaux Publics et Services gouvernementaux Canada

Fisheries & Oceans Canada — Real Properties, Safety and Security

TETRA TECH

revisions		date
0	ISSUED FOR TENDER	2019-03-27

A detail no. / no. du detail
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

project / projet
FISHERIES AND OCEANS CANADA CANADIAN COAST GUARD SEARCH AND RESCUE

drawing / dessin
HARTLEY BAY SAR AND BREAKWATER PONTOON DETAILS

designed / concu: GJG
date: 2019-03-27
drawn / dessine: EB
date: 2019-03-27
approved / approuve
date
Tender / Soumission
PWGSC Project Manager / Administrateur de projets TPSGC
project number / no. du projet: **TRNVHWY03002-13**
drawing no. / no. du dessin: 56134 - 0801 - R1 - HB DETAILS - SHEET 34

Plot Scale: 1:1
PWGSC B1

McALLISTER MARINE SURVEY & DESIGN LTD.
8466 COX DRIVE, MISSION B.C.
CANADA V2V 6V3
604-209-TUGS (8847) FAX 604-826-7202
E-MAIL : mmsdltd@telus.net

June 3, 2016 Our File # V 16/039

Trip in Tow Survey Of

Concrete Floats

For

Vancouver Pile Driving Ltd.

Report of survey undertaken March 8, 2010 review for subsequent 2016 tow by the undersigned surveyor of McAllister Marine Survey & Design Ltd. Survey performed at the request of Mr. Fred McMaster of Vancouver Pile Driving Ltd. for the purposes of approving the towing arrangements and preparations for voyages from the works of Vancouver Pile Driving Ltd. in North Vancouver, B.C. to the Steveston Harbour Authority tie-up in Richmond, B.C. and subsequently to Sydney, B.C. Survey was performed while the units were afloat at the wharves of Vancouver Pile Driving Ltd. in North Vancouver, B.C.

This report consists of 5 pages.

Unit Particulars

The units to be towed consist of a monolithic poured concrete structures fitted with pockets in the concrete deck and internal channels for the later installation of marina services. The structures are formed and poured over large expanded “Styrofoam” blocks and have no bottom shell. One end of each float is to be fitted with a steel weldment in the centerline pocket to serve as base for the towing connection that will distribute towing forces into the structure. We understand that the subject units are identical to the units surveyed and towed in 2010.

Towing Vessel

We understand that the intended tows will be contracted to Gisborne Marine Services with the intention of using the tug. The contractor shall be responsible to ensure that the tug is, in all respects, suitable for the intended tow.

Recommendations

1) Towing connection is to be made to a weldment set into the centerline pocket at one end of each float. The weldments are to be altered from their previous configuration to provide connection points for 2 shackles as shown in the attached drawing. The towing bridle is to be led from the shackle connections through the pockets on the towing end of the float that are transversely outboard of the pocket with the connection.

2) Chafe protection is to be fitted to the synthetic line bridle in way of the outboard pockets where the bridle changes direction from the duct below deck to lead to the tug. We understand that the proposed protection is to be split heavy wall rubber hose that will be closed around the bridle line and secured with heavy steel wire. This method of chafe protection is approved.

3) Chafe protection is to be provided at the point of contact between the tow bridle and the forward end of the float. We understand that the proposed protection will consist of a temporarily installed pipe that will provide a round contact point for the bridle. This method of chafe protection is approved.

4) The outboard towing end wood 12" x 12" rails are to be removed for the tow and secured to the remaining rails securely.

5) Towing speed and towline length to be regulated so as to eliminate sheering of tow as much as possible.

6) Tug to avoid contact with the tow except in calm conditions.

7) Transit of any constricted channel or pass to be made at slack water.

8) That the any of the planned voyage legs be commenced only when the predicted or expected significant wave height for the expected duration of the voyage is 2 feet or less.

9) Towing bridles and connections to be checked for chafe and lead on a regular basis.

10) Assist tugs to be engaged at the master's discretion.

11) Tandem towing is not approved.

12) Float to be lit as a barge during hours in conditions of reduced visibility and at night.

Subject to the above conditions the tows to Steveston Harbour Authority tie-up in Richmond, B.C. and to Sydney, B.C. are approved.

Acceptance and use of this report by the client acknowledges the client's understanding that the report has been composed of information that is believed to be true after reasonable investigation and inquiry but is not warranted to be so. The information was obtained without drilling, diving, ultrasonics, cleaning or opening up to expose parts or conditions ordinarily concealed. There were no tests for tightness or soundness conducted other than the conditions noted visually.

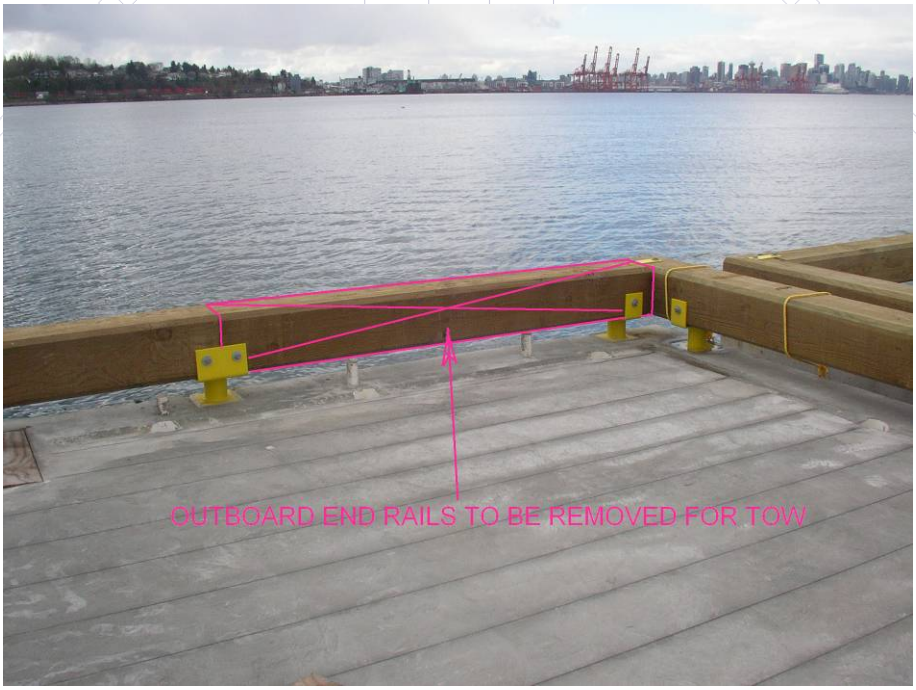
Acceptance and use of this report acknowledges the client's understanding that no determination of stability or structural strength has been made and no opinion is expressed.

Acceptance and use of this report acknowledges the client's understanding that McAllister Marine Survey & Design Ltd. does not accept any responsibility for damage or deterioration not found or discovered during the course of survey, nor for consequential damage, deterioration or loss due to any error or omission.

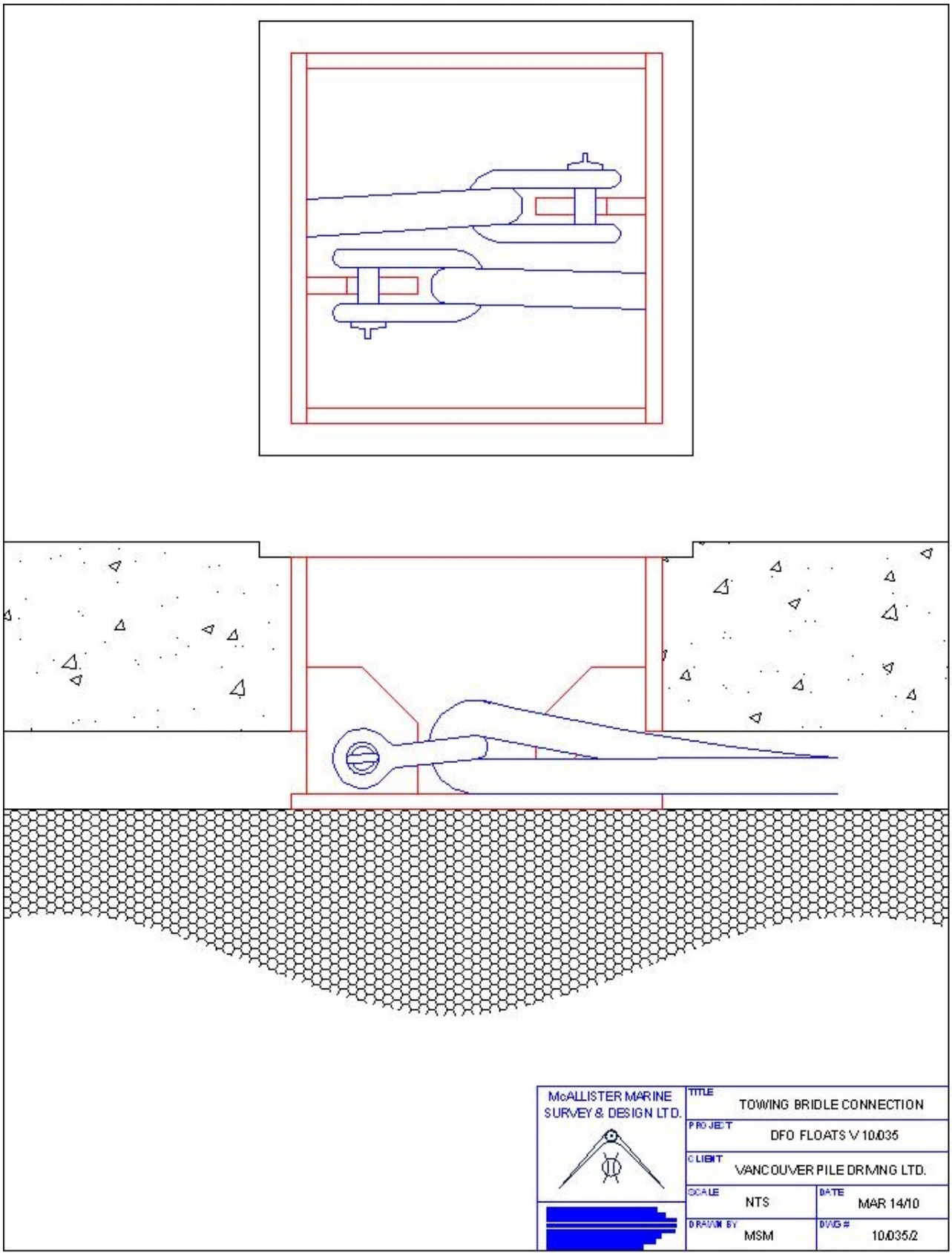
This report issued for the use of Vancouver Pile Driving Ltd.

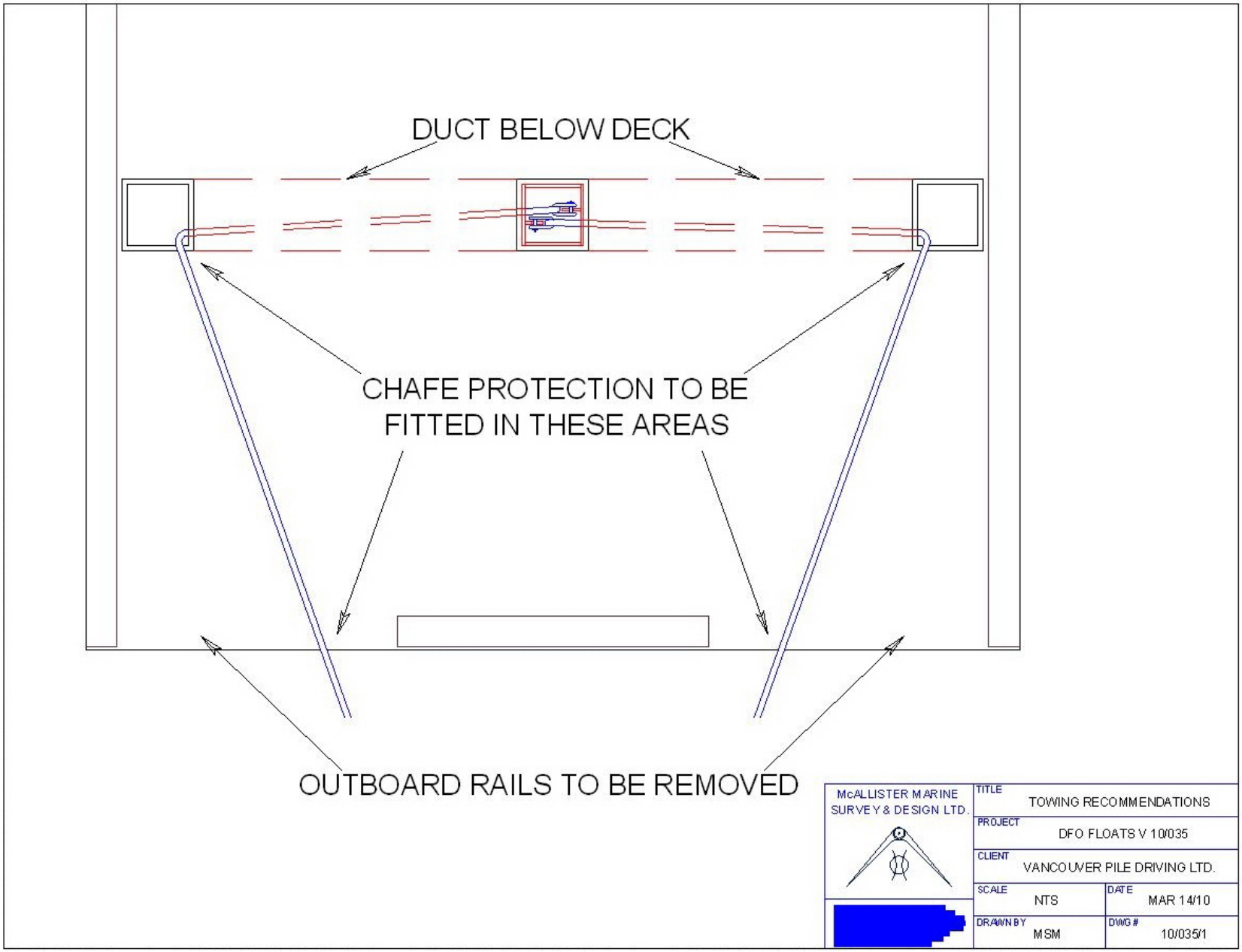
McAllister Marine Survey & Design Ltd.

Marc McAllister
Surveyor



View showing 1 of 2 outboard bull rails to be removed for tow


McALLISTER MARINE
SURVEY & DESIGN LTD.
TITLE
TOWING BRIDLE CONNECTION
PROJECT
DFO FLOATS V 10/035
CLIENT
VANCOUVER PILE DRIVING LTD.
SCALE
NTS
DATE
MAR 14/10
DRAWN BY
MSM
DWG #
10/035/2


DUCT BELOW DECK
CHAFE PROTECTION TO BE FITTED IN THESE AREAS
OUTBOARD RAILS TO BE REMOVED
McALLISTER MARINE SURVEY & DESIGN LTD.
TITLE
TOWING RECOMMENDATIONS
PROJECT
DFO FLOATS V 10/035
CLIENT
VANCOUVER PILE DRIVING LTD.
SCALE
NTS
DATE
MAR 14/10
DRAWN BY
MSM
DWG #
10/035/1

Appendix G

(Not used)

Appendix H

Acceptable Products

REFERENCE SPECIFICATION SECTION	ACCEPTABLE PRODUCTS			REMARKS
	LEGEND	**MATERIALS**	**MANUFACTURER / STYLE / COLOUR**	
06 40 00 Architectural Woodwork	**PL-1**	Plastic Laminate	ARPA; Color – Blu Fes 0754	
	PL-2	Plastic Laminate	ARPA; Color – Grigio 0724	
	PL-3	Plastic Laminate	WILSONART; Color – Linen D427-60	
	W-1	Maple Clear Stain		Lower Cabinets
	SS-1	Solid Surface	CORIAN by DUPONT; Color – Everest	

REFERENCE SPECIFICATION SECTION	ACCEPTABLE PRODUCTS			REMARKS
	LEGEND	MATERIALS	MANUFACTURER / STYLE / COLOUR	
09 30 13 Ceramic Tiling	**TILE**	Floor Tile/Wall Tile – Porcelain	"KRONOS" (MCMD-DG1224) by Ames Tile Color – Black; Grout: Mapei 10 Black	Wall & Floor Tile
	CT-1	Wall Tile – Ceramic	"SOHO" by Ames Tile Color – White (Glossy); Grout: Mapei 38 Avalanche	
	CT-2	Wall Tile – Ceramic	"SOHO" by Ames Color – Black (Glossy); Grout: Mapei 38 Avalanche	
	CT-3	Wall Tile – Ceramic	"IQ" by Ames Tile; Color – Cayenne; Grout: Mapei 38 Avalanche	
	CT-4	Wall Tile – Ceramic	"Trapez" by Ames Tile; Color – White (Glossy); Grout: Mapei 38 Avalanche	

REFERENCE SPECIFICATION SECTION	ACCEPTABLE PRODUCTS			REMARKS
	LEGEND	**MATERIALS**	**MANUFACTURER / STYLE / COLOUR**	
09 65 99 Resilient Flooring for Minor Works	**LINO-1**	Linoleum	"MARMOLEUM" by FORBO ; Color – TE3725 Welsh slate	
	LINO-2	Linoleum	"MARMOLEUM TEXTURA" by FORBO ; Color – TE5217 Withered Prairie	
	RB	Rubber Base	RUBBER BASE by JOHNSONITE; Color – 63 Burnt Umber	
	RF-1	Sports Rubber Flooring	"REPLAY" by JOHNSONITE; Color – RA2 Infrared	
	RF-2	Rubber Treads with Integrated Riser for the Visually Impaired	"RAISED ROUND" RUBBER TILE by JOHNSONITE Color –38 Pewter; Solid Color Insert – 40 Black; Product Code: VIRNRDTRS	

REFERENCE SPECIFICATION SECTION	ACCEPTABLE PRODUCTS			REMARKS
	LEGEND	**MATERIALS**	**MANUFACTURER / STYLE / COLOUR**	
09 68 13 Tile Carpeting	**CPT-1**	Carpet Tile	"TURN TILE" by SHAW CONTRACT Color – Coordinate 04535	
	CPT-2	Carpet Tile	"SQUARE TILE" 5T244 by SHAW CONTRACT Color – Steel Dark 86597	
09 91 23 Interior Painting	**PT-1**	Paint	DULUX; Color – Delicate White; DLX 1001-1	
	PT-2	Paint	DULUX; Color – Baritone; DLX 1149-5	
	PT-3	Paint	DULUX; Color – Aqua Smoke; DLX 1034-5	
	PT-4	Paint	DULUX; Color – Cavalry; DLX 1041-7	

REFERENCE SPECIFICATION SECTION	ACCEPTABLE PRODUCTS			REMARKS
	LEGEND	MATERIALS	MANUFACTURER / STYLE / COLOUR	
10 11 23 Tackboards	**BB-1**	Tackboard	BULLETIN BOARD by FORBO Color – Black Olive 2209	
10 22 26 Manual Operable Partitions	**MOP**	Wallcovering	"TANGLE" by Carnegie Xorel Color – 6213W 10	Classroom movable wall partition

REFERENCE SPECIFICATION SECTION	ACCEPTABLE PRODUCTS			REMARKS
	LEGEND	**MATERIALS**	**MANUFACTURER / STYLE / COLOUR**	
10 28 10 Toilet Bath Accessories	**TR**	Towel Ring	Model 934 Towel Ring by BRADLEY	
	TB	Towel bar	Model 927 Square Towel bar by BRADLEY	
	RB	Robe hook	Model 9119 Heavy-Duty Robe Hook Bradex by BRADLEY	
	GB1	Toilet Side Wall Grab Bar	Grab Bar Series 812 Bradex by BRADLEY	
	GB2	Toilet Back Wall Grab Bar	Grab Bar Series 812 Bradex by BRADLEY	
	US	Utility Shelf	Model 9933, 4 hooks/3 Holders Bradex by BRADLEY	
	MR	Mirror – Unit Washrooms	Model 781-2436 Channel-Frame Mirror by BRADLEY	
	MC	Medicine Cabinet	Model 9661 Bradex by BRADLEY	
	PTD	Paper Towel Dispenser	Model 250-15 – Surface mounted Bradex by BRADLEY	
	SC	Shower Rod & Curtain	Model 953 Shower Curtain Rod Bradex, Model 9537 Antimicrobial Shower Curtain (White) Bradex, Model 9536 Shower Curtain Hook Bradex by BRADLEY	
	TTD	Toilet Tissue Dispenser	Model 508-32 Bradex by BRADLEY	
	WR	Waste Receptacle	Model 377 - 13 gallon capacity by BRADLEY	

REFERENCE SPECIFICATION SECTION	ACCEPTABLE PRODUCTS			REMARKS
	LEGEND	MATERIALS	MANUFACTURER / STYLE / COLOUR	
12 21 13 Wood Blinds	**WB**	Wood Blinds	HUNTER DOUGLAS	

REFERENCE SPECIFICATION SECTION	ACCEPTABLE PRODUCTS			REMARKS
	LEGEND	MATERIALS	MANUFACTURER / STYLE / COLOUR	
14 21 00 Elevator		Wall covering	REAR WALL: Grenadine (L422) 3D Laminate SIDE WALLS: Brushed Stainless Steel (4SS) by KONE 43007	
		Handrail Skirting	HANDRAIL: Flat, straight ends (HR63) Brushed Stainless Steel (4SS) SKIRTING: Brushed Stainless Steel (4SS) by KONE 43007	

NOTE:

.1 This schedule is a separate document from the specification and may list specific manufacturers related to patterns and colours upon which the colour scheme for the project is based.

.2 The above “acceptable products” are listed in order to establish a quality of product upon which a price can be tendered. Other products having the same characteristics will not be excluded. Refer to the specification sections as listed for quality specifics.

.3 The Departmental Representative will consider substitute Products which meet or exceed the properties of the specified Product and are similar in material, construction, thickness, colour, texture, and overall quality, provided that proposals are submitted to the Departmental Representative complete with samples and whatever other data the Departmental Representative may require in order to evaluate the proposed substitute Product. If the Departmental Representative approves the proposed substitute Product, the Contractor will have the option of providing Product listed in the Finish schedule or an approved alternative.

END OF SCHEDULE

tyco

Data Sheet

ioProx – Proximity Readers and Cards

Features That Make a Difference

- Readers are compatible with dualencoded proximity cards – 26-bit Wiegand and Kantech XSF
- Kantech XSF cards can be encoded with over four billion unique codes
- Digital Signal Processing (DSP) ensures quick and reliable card reading
- Weatherproof design for indoor and outdoor applications
- Integrated piezoelectric buzzer & bicolor reader LED
- Quick connect terminal blocks (P225 and P325 series) allows for easy wiring and saves time and money
- Up to 73 cm (29 in) read range (P600)

Integration by Design

Kantech ioProx readers and cards provide an ideal access control solution. They are a cyber-resilient and easy-to-install solution to manage and control access all the while ensuring people, materials and operations are safe. ioProx readers and cards seamlessly integrate with Kantech access control systems including door controllers and EntraPass Security Management Software.

Encoding & Authentication

All ioProx readers are compatible with dual encoded proximity cards – 26-bit Wiegand and Kantech Extended Security Format (XSF). The XSF cards can be encoded with over four billion codes, ensuring no duplication. ioProx keypad readers provide a powerful security solution. Combine an ioProx card presentation with a personal identification number (PIN) to support dual authentication of identity.

Presenting Our Credentials

ioProx cards feature proven, reliable technology that seamlessly integrates with ioProx readers. Cards are available in a variety of shapes and materials. They offer a flexible design and can be attached to a key ring, badge clip or lanyard. In the case of disk shaped P50TAG, it can be attached to any non-metallic surface such as a smart phone. And some cards are suitable for dye sublimation printing.

Johnson Controls

Selecting the Right Reader

ioProx readers can be selected based on mounting options (single gang box or mullion), compatible card formats (26-bit Wiegand or Kantech XSF), read range and authentication (card or card plus PIN).

Read Range

Depending on the model selected and the operating conditions, read range varies from 16.5 cm to 73 cm (6.5 in to 29 in). With its extended range, the P600 Long Range Reader is ideal for parking lots and other long read range applications.

Appealing/Durable Readers

ioProx readers are attractive, compact, weatherized and vandal-resistant, making them suitable for installation in a variety of indoor and outdoor environments. The bicolor reader LED indicates system status. The LED turns green to indicate a successful read when the card is presented to the reader. In addition, the LED can indicate if the alarm system is armed or disarmed. The piezoelectric buzzer provides audible indication of a successful read.

Specifications

Common ioProx Card Reader Specifications	
Compatible Card Formats	Dual encoded - XSF (Kantech Extended Security Format) and 26-bit Wiegand
LED Indicator	Bicolor (Red, Green)
Piezoelectric Buzzer	Integrated
Operating Temperature Range	-35˚C to 65˚C (-30˚F to 150˚F)
Color	Black

Model Number/ Description	Dimensions (H x W x D)	Read Range	Power Supply	Maximum Cable Distance
P225XSF, P225W26 Mullion Mount	11.4 x 4 .4 x 2.1 cm (4.5 x 1.75 x 0.84 in)	Up to 16.5 cm (6.5 in)	4.5 to 14 VDC, max. 45 mA	137 m (450 ft) @ 5 VDC 300 m (1,000 ft) @ 12 VDC
P225KPXSF, P225KPW26 Mullion Mount with Keypad	11.4 x 4 .4 x 2.1 cm (4.5 x 1.75 x 0.84 in)	Up to 16.5 cm (6.5 in)	4.5 to 14 VDC, max. 45 mA	137 m (450 ft) @ 5 VDC 300 m (1,000 ft) @ 12 VDC
P325XSF, P325W26 Single Gang Mount	11.5 x 7.1 x 2.1 cm (4.6 x 2.8 x 0.84 in)	Up to 20.5 cm (8 in)	4.5 to 14 VDC, max. 45 mA	150 m (500 ft) @ 5 VDC 300 m (1,000 ft) @ 12 VDC
P325KPXSF, P325KPW26 Single Gang Mount with Keypad	11.5 x 7.1 x 2.1 cm (4.6 x 2.8 x 0.84 in)	Up to 20.5 cm (8 in)	4.5 to 14 VDC, max. 45 mA	150 m (500 ft) @ 5 VDC 300 m (1,000 ft) @ 12 VDC
P600 Long Range Reader	28.5 x 28.5 x 3.2 cm (11.25 x 11.25 x 1.25 in)	Up to 73 cm (29 in)	12 to 28 VDC, max. 1.5 A	137 m (450 ft) @ 12 VDC 300 m (1,000 ft) @ 28 VDC

Ordering Information

Model Number	Description
Readers	
P225XSF	ioProx reader, XSF, mullion
P225W26	ioProx reader, 26-bit Wiegand, mullion
P225KPXSF	ioProx reader, XSF, mullion
P225KPW26	ioProx reader, 26-bit Wiegand, mullion
P325XSF	ioProx reader, XSF, single-gang
P325W26	ioProx reader, 26-bit Wiegand, single-gang
P325KPXSF	ioProx reader, XSF, single-gang
P325KPW26	ioProx reader, 26-bit Wiegand, single-gang
P600	ioProx reader, long range, XSF/ 26-bit Wiegand selectable
Cards	
P10SHL	ioProx card, XSF/ 26-bit Wiegand, standard (Min. Qty. 50, Increment Qty. 50)
P20DYE	ioProx card, XSF/ 26-bit Wiegand, printable (Min. Qty 50, Increment Qty. 50)
P30DMG	ioProx card, XSF/ 26-bit Wiegand, high coercivity magnetic stripe, printable (Min. Qty. 50, Increment Qty. 50)
P40KEY	ioProx keytag, XSF/ 26-bit Wiegand, (Min. Qty. 25, Increment Qty. 25)
P50TAG	ioProx self-adhesive round tag, XSF/ 26-bit Wiegand (Min. Qty. 50, Increment Qty. 50)

About Johnson Controls

Johnson Controls is a global diversified technology and multi-industrial leader serving a wide range of customers in more than 150 countries. Our 120,000 employees create intelligent buildings, efficient energy solutions, integrated infrastructure and next generation transportation systems that work seamlessly together to deliver on the promise of smart cities and communities. Our commitment to sustainability dates back to our roots in 1885, with the invention of the first electric room thermostat.

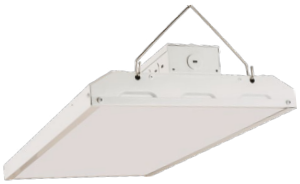
For additional information, please visit www.kantech.com or follow us on Twitter, Facebook and LinkedIn.

KT0231-DS-201906-R04-HS-EN

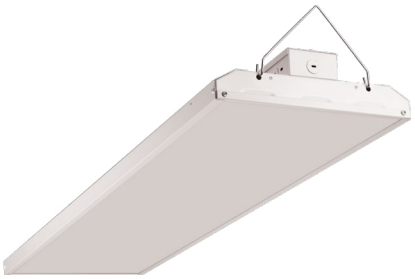
E16H
Econo LED high bay luminaire

Project: _____
Type: _____
Catalogue #: _____
Drawn by: _____
Date: _____

Our new series of LED economical High Bays is an energy efficient solution that is ideal for use in applications such as warehouses, sports arenas, and other large, high ceiling indoor applications.



24"



48"

FEATURES AND SPECIFICATIONS

CONSTRUCTION

Housing
White powder painted 22 gauge steel housing. Well ventilated driver compartment for optimal thermal management.

Installation and hardware
V Hooks for dual point chain or cable hanging (standard). Pendant or surface mount optional.

Lens
Frosted acrylic lens over LEDs provides a diffused distribution of light.

Ambient temperature
-30°C to 50°C.

ELECTRICAL

- Power Factor (PF) - >0.99
- Total Harmonic distortion (THD) - <20%
- 130-132lm/W
- 0-10V dimming standard
- 80+ CRI, 4000K and 5000K color temperature
- 6ft cable is standard
- 120-277V and 347V

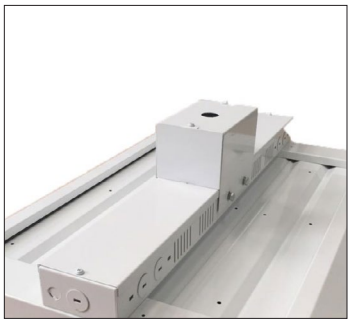
COMPLIANCES

- Meets requirements of ICES-005
- cULus Certified

MOUNTING OPTIONS

SURFACE MOUNT

PENDANT MOUNT WITH HOOKS (V-HOOKS STANDARD)



CONDUIT MOUNT

AVIATION CABLE MOUNT

5 YEAR WARRANTY

QUICKSHIP

LED

DAMP LOCATION

ICES 005

Not all products are qualified on the DLC QPL. To view our DLC qualified products, please consult the DLC Qualified Products List at www.designlights.org/search.

OVERVIEW

Light source	LED
Wattage	90W - 265W
Lumens	11,700lm - 34,980lm
lm/W	130lm/W - 132lm/W
Colour temperature	4000K and 5000K
CRI	80+
Weight	24": 13.45lbs 48": 27lbs

QUICK SHIP ORDERING GUIDE *

Dimensions	Part number	Wattage	Lumens	Voltage	Colour temperature	lm/W	PF	CRI	THD
24"	**E16H-24LA2-2/40K**	90W	11,700lm	120-277V	4000K	130lm/W	0.9	80+	10
24"	**E16H-24LA2-2/50K**	90W	11,790lm	120-277V	5000K	131lm/W	0.9	80+	10
24"	**E16H-24LA2-8/40K**	90W	11,700lm	347V	4000K	130lm/W	0.9	80+	10
24"	**E16H-24LA2-8/50K**	90W	11,790lm	347V	5000K	131lm/W	0.9	80+	10
24"	**E16H-24LA3-2/40K**	135W	17,550lm	120-277V	4000K	130lm/W	0.9	80+	10
24"	**E16H-24LA3-2/50K**	135W	17,685lm	120-277V	5000K	131lm/W	0.9	80+	10
24"	**E16H-24LA3-8/40K**	135W	17,550lm	347V	4000K	130lm/W	0.9	80+	10
24"	**E16H-24LA3-8/50K**	135W	17,685lm	347V	5000K	131lm/W	0.9	80+	10
48"	**E16H-48LA1A-2/40K**	178W	23,140lm	120-277V	4000K	130lm/W	0.9	80+	10
48"	**E16H-48LA1A-2/50K**	178W	23,318lm	120-277V	5000K	131lm/W	0.9	80+	10
48"	**E16H-48LA1A-8/40K**	178W	23,140lm	347V	4000K	130lm/W	0.99	80+	10
48"	**E16H-48LA1A-8/50K**	178W	23,318lm	347V	5000K	131lm/W	0.99	80+	10
48"	**E16H-48LA2A-2/40K**	265W	34,450lm	120-277V	4000K	130lm/W	0.9	80+	10
48"	**E16H-48LA2A-2/50K**	265W	34,715lm	120-277V	5000K	131lm/W	0.9	80+	10
48"	**E16H-48LA2A-8/40K**	265W	34,715lm	347V	4000K	131lm/W	0.99	80+	10
48"	**E16H-48LA2A-8/50K**	265W	34,980lm	347V	5000K	132lm/W	0.99	80+	10

*** QUICK SHIP:** Product availability is subject to change without notice. Please contact your AimLite customer service representative to confirm inventory levels at time of order.

TM21 TABLE – E16H 24"

Time (t) at which to estimate lumen maintenance (hours)	50,000
Lumen maintenance at time (t) (%)	86.90%
Calculated L70 (hours)	120,000
Reported L70 (hours)	> 36,000

TM21 TABLE – E16H 48"

Time (t) at which to estimate lumen maintenance (hours)	50,000
Lumen maintenance at time (t) (%)	86.90%
Calculated L70 (hours)	122,000
Reported L70 (hours)	> 36,000

Comments

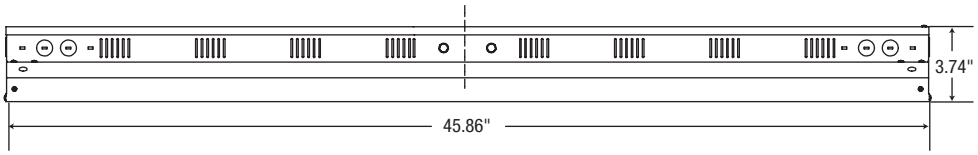
ACCESSORIES (order separately)

BKT486	Conduit mount kit 20 gauge bracket for 120-277V (1pc per fixture)
BKT486-347V	Conduit mount kit 20 gauge bracket for 347V (1pc per fixture)
BKT584-4L	Surface mount bracket for 48LA1A and 24LA2 (set of 2)
BKT584-6L	Surface mount bracket for 48LA2A and 24LA3 (set of 2)
HAR1040	11' aviation cable mount option (set of 2)
WGD063-4-KIT	Wireguard for 48LA1A
WGD063-6-KIT	Wireguard for 48LA2A
WGD904-4-KIT	Wireguard for 24LA2
WGD904-6-KIT	Wireguard for 24LA3

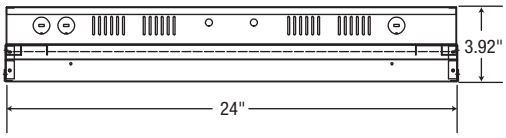
With wireguard

DIMENSIONS

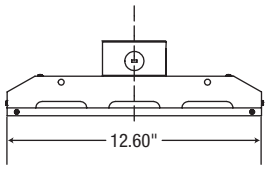
48"



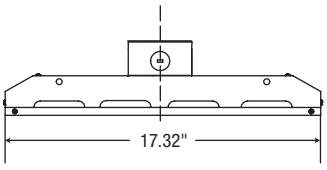
24"



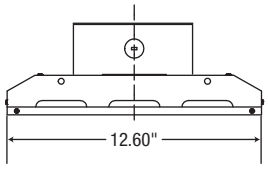
24" - LA2 & 48" - LA1A (120V-277V)



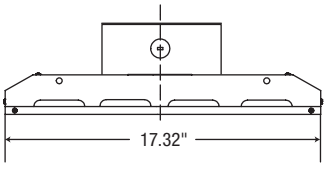
24" - LA3 & 48" - LA2A (120V-277V)



24" - LA2 & 48" - LA1A (347V)



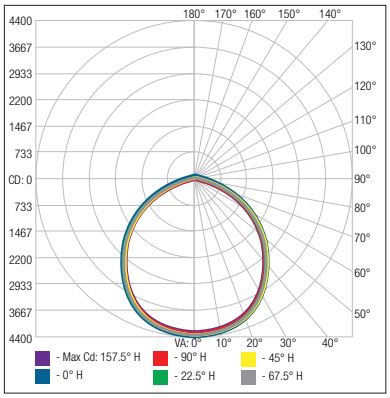
24" - LA3 & 48" - LA2A (347V)



PHOTOMETRIC DATA

E16H-24LA2-(2-8)/40K • 11,231lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	3394.4	30.2%
0-40	5521.4	49.2%
0-60	9347.9	83.2%
60-90	1883.1	16.8%
70-100	719.1	6.4%
90-120	0	0%
0-90	11,231.0	100%
90-180	0	0%
0-180	11,231.0	100%

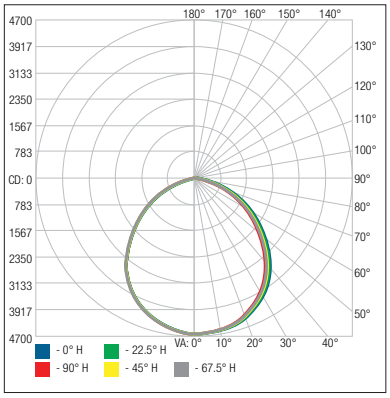
Illuminance at a distance

	Center beam fc	Beam width	
1.7'	1513 fc	4.4'	4.2'
3.3'	401 fc	8.5'	8.2'
5.0'	175 fc	12.9'	12.4'
6.7'	97.4 fc	17.3'	16.6'
8.3'	63.5 fc	21.4'	20.6'
10.0'	43.7 fc	25.7'	24.8'

Vert. spread: 104.3°
Horiz. spread: 102.2°

E16H-24LA2-(2-8)/50K • 11,788.9lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	3564.1	30.2%
0-40	5797.5	49.2%
0-60	9810.9	83.2%
60-90	1978.0	16.8%
70-100	758.7	6.4%
90-120	0	0%
0-90	11,788.9	100%
90-180	0	0%
0-180	11,788.9	100%

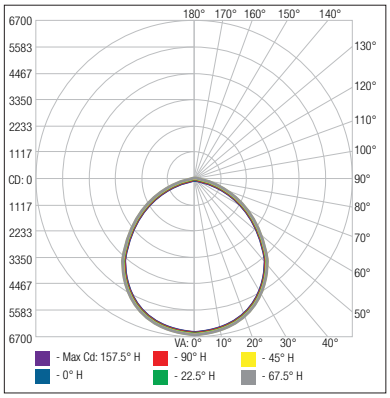
Illuminance at a distance

	Center beam fc	Beam width	
1.7'	1589 fc	4.4'	4.2'
3.3'	422 fc	8.5'	8.2'
5.0'	184 fc	12.9'	12.4'
6.7'	102 fc	17.2'	16.6'
8.3'	66.7 fc	21.4'	20.5'
10.0'	45.9 fc	25.7'	24.4'

Vert. spread: 104.3°
Horiz. spread: 102.1°

E16H-24LA3-(2/8)/40K • 17,208.8lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	5165.0	30%
0-40	8413.4	48.9%
0-60	14,288.4	83%
60-90	2920.3	17%
70-100	1124.5	6.5%
90-120	0	0%
0-90	17,208.8	100%
90-180	0	0%
0-180	17,208.8	100%

Illuminance at a distance

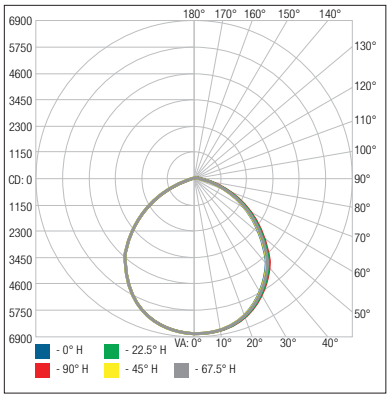
	Center beam fc	Beam width	
1.7'	2301 fc	4.4'	4.3'
3.3'	611 fc	8.5'	8.3'
5.0'	266 fc	13.0'	12.6'
6.7'	148 fc	17.4'	16.9'
8.3'	96.5 fc	21.5'	21.0'
10.0'	66.5 fc	25.9'	25.3'

Vert. spread: 104.7°
Horiz. spread: 103.3°

PHOTOMETRIC DATA (cont'd)

E16H-24LA3-(2/8)/50K • 17,682.9lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	5291.4	29.9%
0-40	8624.1	48.8%
0-60	14,669.5	83%
60-90	3013.4	17%
70-100	1160.4	6.6%
90-120	0	0%
0-90	17,682.9	100%
90-180	0	0%
0-180	17,682.9	100%

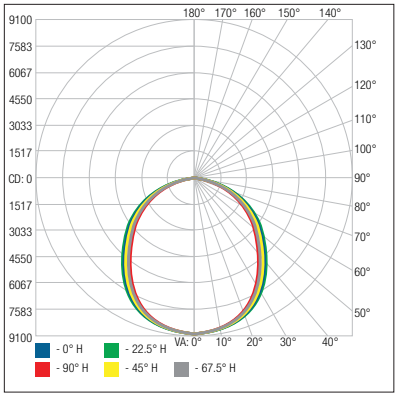
Illuminance at a distance

	Center beam fc	Beam width	
1.7'	2353 fc	4.4'	4.3'
3.3'	624 fc	8.6'	8.4'
5.0'	272 fc	13.0'	12.7'
6.7'	151 fc	17.5'	17.0'
8.3'	98.7 fc	21.7'	21.1'
10.0'	68.0 fc	26.1'	25.4'

Vert. spread: 105.0°
Horiz. spread: 103.7°

E16H-48LA1A-(2-8)/40K • 23,330.8lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	6848.8	29.4%
0-40	11,081.9	47.5%
0-60	18,958.7	81.3%
60-90	4367.6	18.7%
70-100	1746.4	7.5%
90-120	4.5	0%
0-90	23,326.3	100%
90-180	4.5	0%
0-180	23,330.8	100%

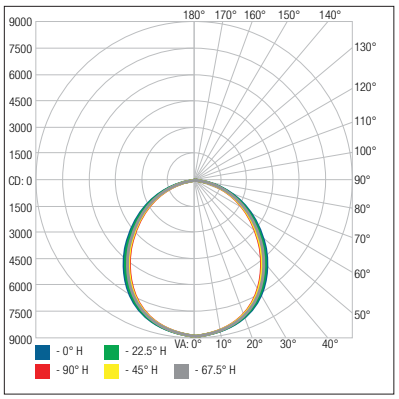
Illuminance at a distance

	Center beam fc	Beam width	
1.7'	3115 fc	4.6'	4.1'
3.3'	827 fc	9.0'	7.9'
5.0'	360 fc	13.7'	11.9'
6.7'	201 fc	18.3'	16.0'
8.3'	131 fc	22.7'	19.8'
10.0'	90.0 fc	27.3'	23.8'

Vert. spread: 107.6°
Horiz. spread: 100.0°

E16H-48LA1A-(2-8)/50K • 23,192.7lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	6936.1	29.9%
0-40	11,282.9	48.6%
0-60	19,157.9	82.6%
60-90	3954,5	17.1%
70-100	1516,7	6.5%
90-120	22.2	0.1%
0-90	23,112.5	99.7%
90-180	80.3	0.3%
0-180	23,192.7	100%

Illuminance at a distance

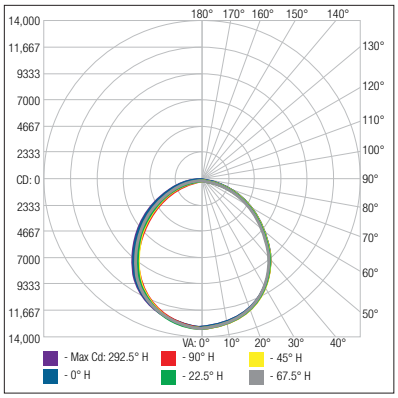
	Center beam fc	Beam width	
1.7'	3085 fc	4.5'	4.2'
3.3'	819 fc	8.7'	8.2'
5.0'	357 fc	13.2'	12.5'
6.7'	199 fc	17.6'	16.7'
8.3'	129 fc	21.9'	20.7'
10.0'	89.1 fc	26.3'	25.0'

Vert. spread: 105.6°
Horiz. spread: 102.7°

PHOTOMETRIC DATA (cont'd)

E16H-48LA2A-(2-8)/40K • 33,902.3lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	10,135.6	29.9%
0-40	16,433.5	48.5%
0-60	27,912.0	82.3%
60-90	5990.3	17.7%
70-100	2330.8	6.9%
90-120	0	0%
0-90	33,902.3	100%
90-180	0	0%
0-180	33,902.3	100%

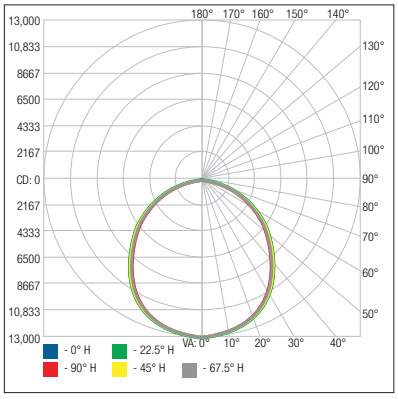
Illuminance at a distance

	Center beam fc	Beam width	
1.7'	4544 fc	4.4'	4.2'
3.3'	1206 fc	8.6'	8.2'
5.0'	525 fc	13.0'	12.4'
6.7'	293 fc	17.5'	16.6'
8.3'	191 fc	21.6'	20.6'
10.0'	131 fc	26.1'	24.8'

Vert. spread: 105.0°
Horiz. spread: 102.3°

E16H-48LA2A-(2-8)/50K • 33,522.3lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	9978.4	29.8%
0-40	16,190.6	48.3%
0-60	27,552.5	82.2%
60-90	5969.8	17.8%
70-100	2333.6	7%
90-120	0	0%
0-90	33,522.3	100%
90-180	0	0%
0-180	33,522.3	100%

Illuminance at a distance

	Center beam fc	Beam width	
1.7'	4468 fc	4.5'	4.3'
3.3'	1186 fc	8.7'	8.3'
5.0'	516 fc	10.1'	12.5'
6.7'	288 fc	17.6'	16.8'
8.3'	187 fc	21.8'	20.8'
10.0'	129 fc	26.2'	25.0'

Vert. spread: 105.3°
Horiz. spread: 102.8°

Custom Lighting Design & Manufacture
3611 Commercial Street Vancouver, BC V5N 4G1
T. 604.872.5503 F. 604.872.5560

IP50-655522

Project:	Type:	QTY:
Product Code:		

Product Code

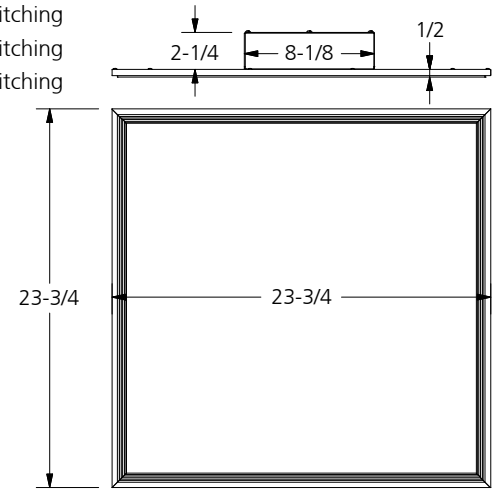
IP50 - 655522 - FRAME COLOR - INTENSITY - VOLTAGE - MOUNTING

FRAME COLOR
- ☐ A =aluminum
- ☐ W =white
- ☐ CC=custom color

INTENSITY
- ☐ 25W35K=3500 lm
- ☐ 25W41K=3700 lm
- ☐ 25W52K=3900 lm
- ☐ 50W35K=6500 lm
- ☐ 50W41K=6900 lm
- ☐ 50W52K=7300 lm

VOLTAGE
- ☐ 120 =120V
- ☐ 277 =277V
- ☐ 347 =347V
- ☐ 120D =120V dimming
- ☐ 120D10=120V, 0-10V dimming
- ☐ 277D10=277V, 0-10V dimming
- ☐ 347D10=347V, 0-10V dimming
- ☐ DS1 =120V double switching
- ☐ DS2 =277V double switching
- ☐ DS3 =347V double switching

MOUNTING
- ☐ T =T-bar grid
- ☐ CS48 =cable suspension 48”
- ☐ CSCC=cable suspension custom length
- ☐ SM =surface mount
- ☐ FM1 =flush mount, recessed driver box
- ☐ FM2 =flush mount, remote driver box
- ☐ RFM =Recessed Flange Mount



Features + Specifications

Intended Use:
- Building interior, damp location OK

Construction:
- Extruded aluminum frame
- Full size sheet metal backing for plastic lens
- All metal driver box with generous wiring space inside
- Suitable for return-air plenum application

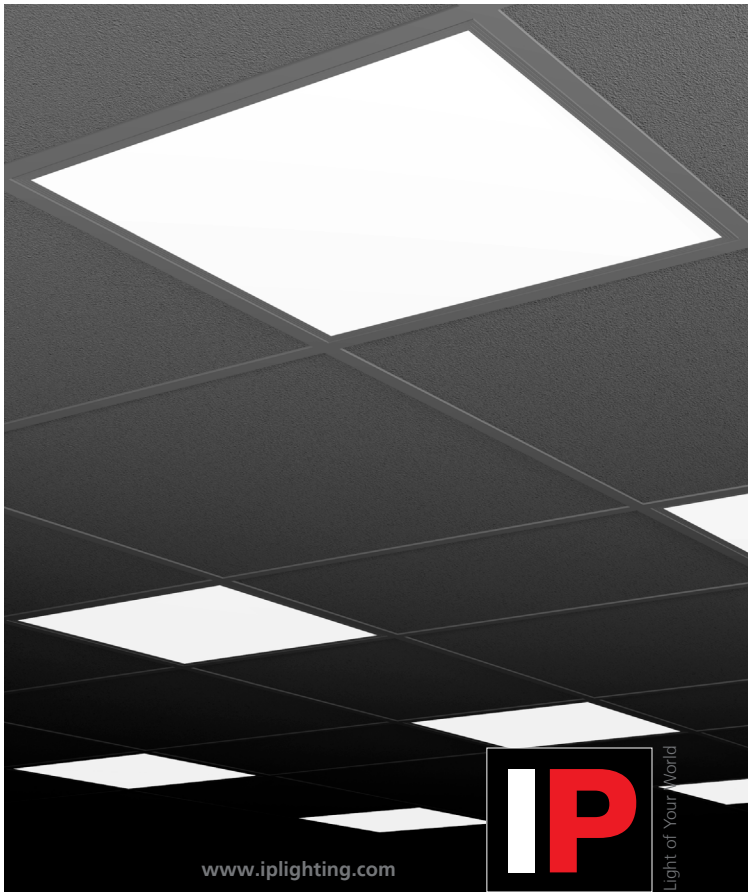
Frame Finish:
- A=anodized aluminum, W=powder coat paint

Optical System:
- Mid power Samsung LM561B SMD with quarter binning and 80CRI
- LM561B is LM80 tested for high lumens maintenance
- TM-21 data demonstrated L70 up to 90,000 hours of projected life when operate under normal 25°C ambient temperature around fixture
- 3500K, 4100K + 5200K CCT commonly available
- 2700K and 3000K CCT available only on special order requiring minimum order quantities
- SMDs mounted on rigid all aluminum PCB
- PCB is attached to aluminum extrusion frames for optimum heat management
- Special PMMA opal light guide lens distribute light evenly
- This edge lit design provides high brightness without glare and hot spots
- Perfect for general lighting application for schools, offices and other work areas

Electrical System:
- High efficiency High power factor drivers with total system watt of 30W and 60W
- 85VAC to 264VAC variable input voltage eliminates voltage drop or voltage spike (common in large commercial and institutional buildings)
- Special 120V dimmable driver available
- DS = Double switching (50% light output) available
- 277V & 347V also available

Mounting:
- Recessed mount in 24” x 24” T-bar ceiling grid
- Free air suspension with aircraft cable
- Surface mount
- Flush mount
- Recessed flange mount

Certified to CSA C22.2 No.250.0 Conformed to UL 1598
Certification Marks (where applicable) will be found on our luminaires and its components



Datecode 20150406

Warranty - Up To 5 Years

VP4-L

4ft LED vapour tight

Feature rich contractor select

Project: _____

Type: _____

Catalogue #: _____

Drawn by: _____

Date: _____

A luminaire ideal for a variety of industrial, commercial, vandal resistant and residential applications. Installed either indoors or outside, the VP4-L provides superior light distribution. Intended for applications where moisture and/or dust may be present.

APPLICATIONS*

- Parking garages
- Subways
- Schools
- Industrial facilities
- Exterior retail areas
- Storage rooms
- Garden centers
- Airports

FEATURES AND SPECIFICATIONS

CONSTRUCTION

Housing

– Lightweight, flexible and durable polycarbonate construction makes the luminaire vandal resistant and highly impact resistant

– The housing is sealed with a uniform gasket that blocks the ingress of moisture and dust and reinforced snap clips lock the luminaire together

– Row mount aligners molded into housing ends

– Sealed strain relief/cable gland kit included

– Power connection is easily accomplished through a pre-drilled hole at one end of the housing that comes populated with a wet location watertight gland

Lens

The UV stabilized polycarbonate lens with LED diffusing pigment is impervious to rust or rot and is unaffected by extreme temperatures.

SPECIFICATIONS

– Easy to clean and service

– LED technology for long term energy savings

Driver

– 120V, 120V-277V and 347V

– 0-10V dimming driver standard (down to 1%)

– Protection against short circuit and open circuit, inrush current complies with NEMA 410, transient protector complies with IEEE C62.41, 2.5kV/2.5kV

Ambient temperature

-40°C to +40°C.

Mounting

Stainless steel mounting hardware for wall, ceiling or suspended mounting.

COMPLIANCES

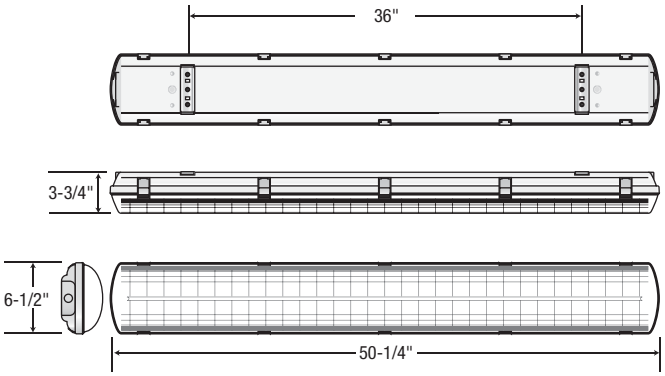
– Suitable for damp and wet locations

– IP65

– Meets requirements of ICES-005

– ETL

DIMENSIONS



* Not recommended for car wash applications.

5 YEAR WARRANTY

LED

DAMP LOCATION

WET LOCATION

65 IP RATING

ICES 005

DLC QPL LISTED

ETL LISTED c US Intertek

Not all products are qualified on the DLC QPL. To view our DLC qualified products, please consult the DLC Qualified Products List at www.designlights.org/search.

OVERVIEW

Wattage	28W - 63W
Lumens	3500lm - 7700lm
Lm/W	122.2lm/W - 133.3lm/W
Colour temperature	3000K, 3500K, 4000K and 5000K
CRi	80+
Weight	8.45lbs
Ambient temperature	-40°C to +40°C
Construction	Polycarbonate housing/lens/clips and stainless steal mounting hardware
Mounting	Surface, suspended, rigid mono point, pivot brackets

ORDERING GUIDE

VP4 — L — ____ — ____ / ____ / ____

Series	Lamp type	Lumen package delivered	Voltage	Colour temperature	Options
VP4	**L -** LED	**A1A -** 3500 lumens (28W) **A2A -** 4300 lumens (33W) **A3A -** 5200 lumens (39W) **A4A -** 7700 lumens (63W)	**4 -** 120V **8 -** 347V **2 -** 120-277V	**30K -** 3000K **35K -** 3500K **40K -** 4000K **50K -** 5000K	**DIM1 -** 5 wire cable for AC and 0-10V dimming* **DIM2 -** Line voltage dimming driver 120V** **L6 -** 6' white power cord **L10 -** 10' white power cord **L6-BK -** 6' black power cord **L10-BK -** 10' black power cord **SS -** Stainless steel latches **OS -** Occupancy sensor *** **DL -** Emergency backup (from 0°C - 25°C) 120V only**** **TP -** Vandal resistant screws***** **HCRI -** High CRI 90+****** **KV -** 10kV Surge protector **RMB-05 -** For rigid mono point on a bracket with 3/4" (1/2npt) **RMB-075 -** For rigid mono point on bracket with 1" (3/4npt) center hole drilled on bracket **RMP-05 -** Rigid mono point with 3/4" (1/2npt) center hole drilled in luminaire **RMP-075 -** Rigid mono point with 1" (3/4npt) center hole drilled in luminaire **PVPM-05 -** Pivot mount bracket with 3/4" (1/2npt) drilled on bracket **PVPM-075 -** Pivot mount bracket with 1" (3/4npt) drilled on bracket **PVM -** Pivot mount brackets (surface mount ceiling and wall) **EH -** End hole 7/8" **CH -** Center hole 7/8" **AC -** Aviation cable

* When selecting DIM1 option please also select cable option whether L6, L10, L6-BK or L10-BK.
** DIM2 is for A1A, A2A and A3A lumen packages.
*** To see available options, please consult the occupancy sensors section.
**** Fixture functional in AC mode, when power goes off emergency bodine powers LED boards. One bodine per fixture is standard unless otherwise specified.
***** 1 tamper proof bit provided with order. For additional tamper proof bits, see accessories.
****** HCRI option may decrease lumen output from 15% to 19% depending on the CCT.

ACCESSORIES (order separately)

HAR06-TPBIT-UDR	Tamper proof 2" Steel Power Bit

TM21 TABLE VP4-L

Time (t) at which to estimate lumen maintenance (hours)	50,000
Lumen maintenance at time (t) (%)	84.37%
Calculated L70 (hours)	99,000
Reported L70 (hours)	>60,000

Comments

OCCUPANCY SENSORS

ON-OFF SENSORS

Detection - On at *(Detection Area)* % during *(Hold Time)* min. Off

Part number	Position	Voltage	Technology	Height	Detection Area	Hold time	Daylight min level	Remote*	Location
OSE-PO-0301	External	120-347V	PIR	20-40ft	100%	20min	NA		Dry, -10°C to 70°C
OSE-PO-0302	External	120-347V	PIR	20-40ft	100%	20min	NA		Dry, -40°C to 4°C
OSE-PO-0501	External	120-347V	PIR	15-40ft	100%	15min	3000 lux	OSI-FSIR-100	Dry, 0°C to 70°C
OSE-PO-0502	External	120-347V	PIR	15-40ft	100%	15min	3000 lux		Dry, 0°C to 70°C
OSE-PO-0701	External	120-277V	PIR	20ft	100%	15min	NA		Wet, -40°C to 70°C
OSI-FO-0301	Internal	120-277V	High Frequency	32ft max	100%	20min	Disable		Dry and wet, -25°C to 60°C
OSI-FO-0601	Internal	120-347V	High Frequency	25ft max	100%	30min	Disable	OSI-RC-MH02	Dry and wet, -35°C to 70°C
OSI-FO-0602	Internal	120-347V	High Frequency	25ft max	100%	15min	Disable	OSI-RC-MH02	Dry and wet, -35°C to 70°C
OSI-FO-0603	Internal	120-347V	High Frequency	25ft max	100%	15min	100 lux	OSI-RC-MH02	Dry and wet, -35°C to 70°C

* To be ordered separately

BI-LEVEL SENSORS

Detection - On at *(Detection Area)* % during *(Hold Time)* min., then *(Stand-by Dim level)* %

Part number	Position	Voltage	Technology	Height	Detection Area	Hold time	Stand-by Dim level	Daylight min level	Remote*	Location
OSI-FB-0301	Internal	120-277V	High Frequency	32ft max	100%	20min	30%	Disable		Dry and wet, -25°C to 60°C
OSI-FB-0302	Internal	120-277V	High Frequency	32ft max	100%	20min	10%	Disable		Dry and wet, -25°C to 60°C
OSI-FB-0303	Internal	120-277V	High Frequency	32ft max	100%	20min	50%	Disable		Dry and wet, -25°C to 60°C
OSE-FB-0402	External	120-347V	High Frequency	50ft max	100%	20min	30%	50 lux	OSI-RC-MH02	Wet, -35°C to 55°C
OSI-FB-0603	Internal	120-347V	High Frequency	25ft max	100%	15min	40%	Disable	OSI-RC-MH02	Dry and wet, -35°C to 70°C
OSI-FB-0604	Internal	120-347V	High Frequency	25ft max	100%	30min	40%	Disable	OSI-RC-MH02	Dry and wet, -35°C to 70°C
OSI-FB-0605	Internal	120-347V	High Frequency	25ft max	100%	15min	30%	Disable	OSI-RC-MH02	Dry and wet, -35°C to 70°C
OSI-FB-0606	Internal	120-347V	High Frequency	25ft max	100%	15min	10%	Disable	OSI-RC-MH02	Dry and wet, -35°C to 70°C

* To be ordered separately

TRI-LEVEL SENSORS

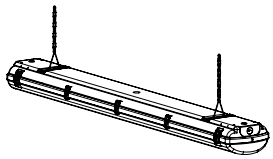
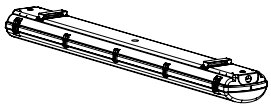
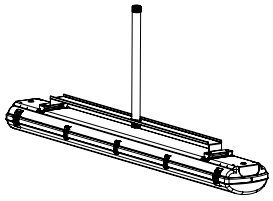
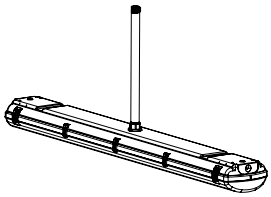
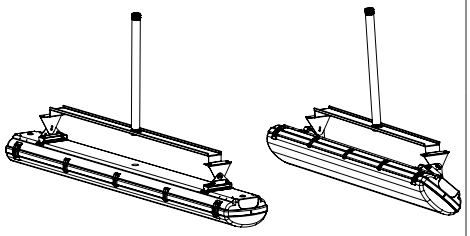
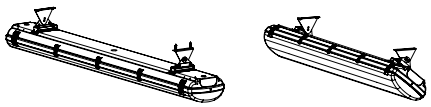
Detection - On at *(Detection Area)* % during *(Hold Time)* min., then *(Stand-by Dim level)* % during *(Stand-by period)* min. Off

Part number	Position	Voltage	Technology	Height	Detection Area	Hold time	Stand-by Dim level	Stand-by period	Daylight min level	Remote*	Location
OSI-FT-0301	Internal	120-277V	High Frequency	32ft max	100%	20min	30%	10min	Disable		Dry and wet, -25°C to 60°C
OSE-FT-0402	External	120-347V	High Frequency	50ft max	100%	30min	30%	10min	50 lux	OSI-RC-MH02	Wet, -35°C to 55°C
OSI-FT-0601	Internal	120-347V	High Frequency	25ft max	100%	30min	30%	10min	Disable	OSI-RC-MH02	Dry and wet, -35°C to 70°C

* To be ordered separately

aimlite.com/documentation/technical-information/

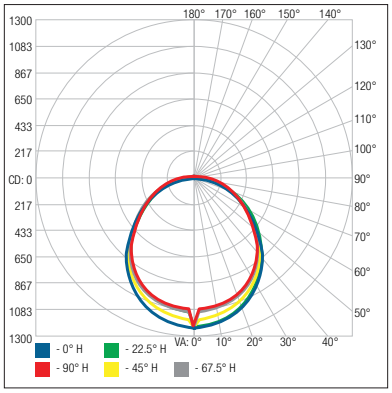
MOUNTING TYPE

SUSPENDED (standard)	– V hooks included – Can be suspended with cable or chain (provided by others)	
SURFACE (standard)	– Surface ceiling brackets included	
RMB-05 Rigid mono point on a bracket with 3/4" (1/2npt) **RMB-075** Rigid mono point on bracket with 1" (3/4npt) center hole drilled on bracket	– Rigid mono point (with bracket support) – Bracket can be predrilled for 1/2'' or 3/4'' NPT, select appropriate compatible size. Should additional hole on top of luminaire be required, select CH option. (stem provided by others)	
RMP-05 Rigid mono point with 3/4" (1/2npt) center hole drilled in luminaire **RMP-075** Rigid mono point with 1" (3/4npt) center hole drilled in luminaire	– Rigid mono point (pipe through luminaire) – Luminaire can be predrilled for 1/2" or 3/4" NPT, select appropriate compatible size. A waterproof hub will be provided to preserve IP rating of the fixture. (Stem provided by others)	
PVPM-05 Pivot mount bracket with 3/4" (1/2npt) drilled on bracket **PVPM-075** Pivot mount bracket with 1" (3/4npt) drilled on bracket	– Two pivot mount brackets installed on rigid mount bracket support. Bracket can be predrilled for 1/2" or 3/4" NPT, select appropriate compatible size. Should additional hole on top of luminaire be required, select desired CH option. (Stem provided by others)	
PVM Pivot mount brackets (surface mount)	– Two pivot mount brackets attached to ceiling mount brackets provided with luminaire (surface mount)	

PHOTOMETRIC DATA

VP4-LA1A-8/40K • 3484.9lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	906.2	26%
0-40	1480.7	42.5%
0-60	2578.0	74%
60-90	784.5	22.5%
70-100	449.5	12.9%
90-120	106.3	3%
0-90	3362.5	96.5%
90-180	122.5	3.5%
0-180	3484.9	100%

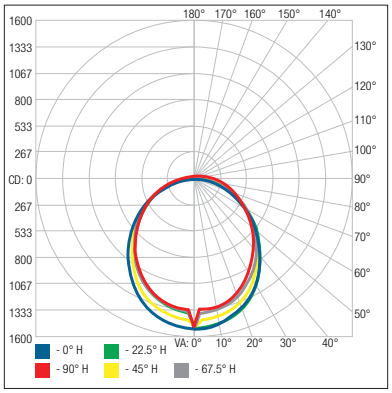
Illuminance at a distance

	Center beam fc	Beam width	
1.7'	427 fc	4.6'	4.3'
3.3'	113 fc	9.0'	8.3'
5.0'	49.4 fc	13.6'	12.5'
6.7'	27.5 fc	18.2'	16.8'
8.3'	17.9 fc	22.6'	20.8'
10.0'	12.4 fc	27.2'	25.0'

Vert. spread: 107.3°
Horiz. spread: 102.7°

VP4-LA2A-8/40K • 4337.4lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	1109.1	25.6%
0-40	1797.0	41.4%
0-60	3108.1	71.7%
60-90	1008.1	23.2%
70-100	629.4	14.5%
90-120	192.5	4.4%
0-90	4116.3	94.9%
90-180	221.2	5.1%
0-180	4337.4	100%

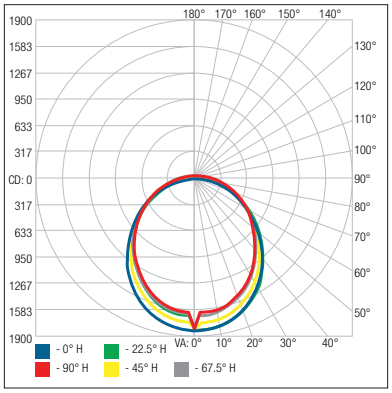
Illuminance at a distance

	Center beam fc	Beam width	
1.7'	526 fc	4.5'	4.1'
3.3'	140 fc	8.7'	7.9'
5.0'	60.8 fc	13.2'	12.0'
6.7'	33.9 fc	17.6'	16.0'
8.3'	22.1 fc	21.9'	19.9'
10.0'	15.2 fc	26.3'	24.0'

Vert. spread: 105.6°
Horiz. spread: 100.3°

VP4-LA3A-8/40K • 5198.8lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	1339.6	25.8%
0-40	2167.6	41.7%
0-60	3741.2	72%
60-90	1195.8	23%
70-100	743	14.3%
90-120	226.2	4.4%
0-90	4937.0	95%
90-180	261.8	5%
0-180	5198.8	100%

Illuminance at a distance

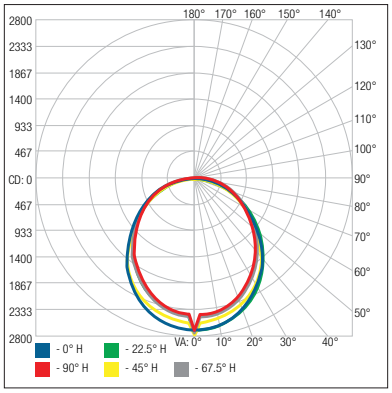
	Center beam fc	Beam width	
1.7'	637 fc	4.4'	4.0'
3.3'	169 fc	8.6'	7.8'
5.0'	73.6 fc	13.1'	11.9'
6.7'	41.0 fc	17.5'	15.9'
8.3'	26.7 fc	21.7'	19.7'
10.0'	18.4 fc	26.2'	23.8'

Vert. spread: 105.2°
Horiz. spread: 99.9°

PHOTOMETRIC DATA (cont'd)

VP4-LA4A-8/40K • 7706.4lm

Polar candela distribution



Zonal lumen summary

Zone	Lumens	% Fixture
0-30	1966.8	25.5%
0-40	3184.6	41.3%
0-60	5513.3	71.5%
60-90	1788.7	23.2%
70-100	1118.3	14.5%
90-120	347.4	4.5%
0-90	7302.0	94.8%
90-180	404.3	5.2%
0-180	7706.4	100%

Illuminance at a distance

	Center beam fc	Beam width	
1.7'	935 fc	4.5'	4.1'
3.3'	248 fc	8.7'	7.9'
5.0'	108 fc	13.3'	12.0'
6.7'	60.2 fc	17.8'	16.1'
8.3'	39.2 fc	22.0'	19.9'
10.0'	27.0 fc	26.5'	24.0'

Vert. spread: 105.9°
Horiz. spread: 100.3°

VTEV-LED

WALL | CEILING | PENDANT | OUTDOOR

Construction:
- Steel chassis and end caps
- Diffuser is white smooth acrylic

Light Source:
- LED
- Dimming (0 - 10v) to 10% **Included**

Notes:
- Mounts to standard J-Box with slotted anchor holes
- Optional battery backup (36" or 48" only)
- Vertical or Horizontal mounting
- ADA compliant
- UL and CUL listed **DAMP** location
- LED Components
  - Replaceable Module
  - CRI > 80
  - Universal 120/277 volt standard
  - 5-Year Warranty on LED Components

Type:	
Job Name:	

VTEV-24-LED
Height - 4 ¼"
Depth - 3"
Length - 24"

VTEV-36-LED
Height - 4 ¼"
Depth - 3"
Length - 36"

VTEV-48-LED
Height - 4 ¼"
Depth - 3"
Length - 48"

DIMMABLE | c UL us LISTED | MADE IN AMERICA

ORDERING INFORMATION

Example: VTEV-36-LED-U-27W-4-Z1-WSA

Model	Cage	Voltage	Lamping	Kelvin	Finish	Diffuser	Options
VTEV-24-LED		**U** 120 - 277	**18w** LED / 2000lm (111 lm per watt)	**2** 3000K **4** 4000K	**T6** Pewter **W2** Gloss White **Z1** Satin Bronze **Z3** Text Bronze	**WSA** White Smooth Acrylic	**DIM** LED dimming driver (0 - 10v) Dimming to 10% (**Included**)
VTEV-36-LED			**27w** LED / 3000lm (111 lm per watt)	**Optional** **3** 3500K	**Optional** (See Price List) **W1** Yolk **W2** Gloss White **W3** Text White **B2** Text Black **T4** Shimmer Gray **M13** Anod Silver **W13** Pearl Beige		**Battery Backup Options** **BB10** 10 Watts (1170lm) for 90-Minutes
VTEV-48-LED			**36w** LED / 4000lm (111 lm per watt)				

28435 Industry Drive., Valencia, California 91355
West Coast Sales: 800-325-4448 /661-257-0286• fax 800-323-2346 /661-257-0201
East Coast Sales: 866-350-0991 • fax 866-490-5754
www.lightwayind.com • sales@lightwayind.com

Liteline

LEDBAR

LED Fluorobar

Cabinet, Cove & Display

Job Information		
Project Name		Type
Location		
Quantity		Date
Contact/Phone		
Notes		

Features

Housing
Durable extruded aluminum frame with frosted smooth lens. Suitable for dry location applications only. On-body on/off switch is provided for individual control (except 9" models).

LED Driver
Fixture is provided with built-in silent non-flicker electronic LED driver, 120V, 50 / 60Hz.

Light Output
This accent light is available in 2700 K, 3000 K, 4000 K or 5000 K colour temperatures, providing up to 1800 lumens, 111 lumens/watt.

Dimming
Fixture is 100~0% dimmable with industry standard TRIAC, ELV and Incandescent dimmers.

LED Characteristics
Powered by LED integrated strip that maintains uniform intensity with 70% lumens at 36,000 hours with a rated life of 25,000 hours average life; with 90 CRI for 2700K fixtures and a minimum of 80 CRI for other fixtures.

Beam Spread
The fixture lens provides for 160° beam spread.

Linking
Complete with a joiner, these no shadow linking fixtures can be linked up to 10 units in a single run.

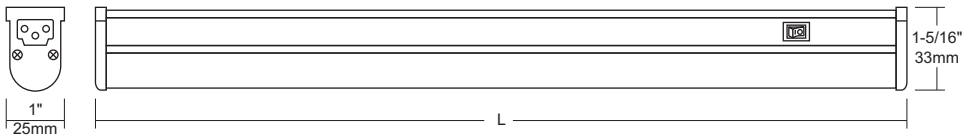
Mounting Kit
Hardware provided for mounting fixture to standard horizontal surfaces or vertical wall surface.

Operating Temperature
-10°C~40°C (14°F~104°F).

SPECIFICATION	
Approved Location	Dry
Beam Angle	160°
CCT	2700 K / 3000 K / 4000 K / 5000 K
Certification	cULus
Connection Type	3-Wire
CRI	90+/80+
Dimming	Yes
Dimming Technology	TRIAC / ELV / Incandescent
Lumens	Up to 1800
Lumens per watt	Up to 111
Max. Operating Temp.	40°C
Min. Start Temp.	-10°C
Lumen Maintenance	70% @ 36,000 hrs
Power Factor	>0.9
Rated Life	25,000 hrs
THD	<15
Voltage	120V
Warranty	3 Years
Wattage	Up to 22

Description

This LED Fluorobar light is a linear light with an integrated LED strip. Available with various lengths to meet any installation application.



		LEDBAR9	LEDBAR14	LEDBAR23	LEDBAR34	LEDBAR46	LEDBAR58
Length (L)		9" 229mm	13½" 344mm	22⅝" 575mm	34½" 875mm	46¼" 1175mm	58" 1475mm
Lumens	2700 K	150	250	550	850	1000	1200
	3000 K	250	400	775	1175	1500	1800
	4000 K	250	400	775	1175	1500	1800
	5000 K	250	400	775	1175	1500	1800

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ENERGY STAR

JA8 [1] TITLE 24

Ordering Guide

LEDBAR [Fixture Length] - [Colour Temperature]

Fixture Length:
- **9 :** 9", 3W
- **14 :** 13½", 5W
- **23 :** 22⅝", 9W
- **34 :** 34½", 14W[2]
- **46 :** 46¼", 18W
- **58 :** 58", 22W

Colour Temperature:
- **27K-90 :** 2700 K, 90 CRI[1,2]
- **30K :** 3000 K
- **40K :** 4000 K
- **50K :** 5000 K

Notes:
[1] Title 24 is currently only available with 2700 K CCT. [2] 2700 K LEDBAR34 not energy star certified.
Accessories are sold separately. For additional options consult your Liteline representative.
Due to our continued efforts to improve our products, product specifications are subject to change without notice.

Liteline Corporation

Telephone
416.996.1856
1.866.730.7704

Fax
905.709.5255
1.888.738.9736

LITELINE.COM

Accessories (Power feed required)

Power Cord

ALFT6000-WH-3
6' Flexible 3-wire power cord for FluoroBar series.

FBT6124-BL-WH-3
24" Flexible 3-wire power cord with bare leads.

ALFT6000S-WH-3
6' Flexible 3-wire power cord with on/off switch, for FluoroBar series.

ALFT6016-WH-3
16" Flexible 3-wire power cord for FluoroBar series.

Power Cord with 90° Connector

ALFT60901-WH-3
6' Flexible 3-wire power cord with 90° connector (top connection).

ALFT60904-WH-3
6' Flexible 3-wire power cord with 90° connector (right connection).

ALFT60902-WH-3
6' Flexible 3-wire power cord with 90° connector (left connection).

ALFT60903-WH-3
6' Flexible 3-wire power cord with 90° connector (bottom connection).

Hardwire Box

ALFT6300-WH
Hardwire box for FluoroBar series, with on/off switch.

Flexible Cord with 90° Connectors

ALFT90-WH-3
6" Flexible 3-wire cord with 90° connectors (top connection).

ALFT903-WH-3
6" Flexible 3-wire cord with 90° connectors (right connection).

ALFT901-WH-3
6" Flexible 3-wire cord with 90° connectors (left connection).

ALFT902-WH-3
6" Flexible 3-wire cord with 90° connectors (bottom connection).

Flexible Connectors

FBT6106-WH-3
6" Flexible 3-wire connector.

FBT6136-WH-3
36" Flexible 3-wire connector

FBT6100-WH-3
12" Flexible 3-wire connector.

FBT6124-WH-3
24" Flexible 3-wire connector.

Clips

LEDBAR-MAGCLIP-3
Magnetic mounting clips for LEDBAR, 3-pack.

PLPC-LED

Type:	
Job Name:	

Construction:
- Steel pan and rings
- Diffuser is white smooth acrylic
- Optional Polycarbonate diffuser (WSP) or high efficiency white smooth acrylic lens designed for LED light source (WSAHE)

Light Source:
- LED
- Dimming to 10% **Included**

Notes:
- Keyhole slots for standard J-box
- Optional battery backup - Requires 1 ¾" extension ring
- UL and CUL listed **DAMP** location
- LED Components
  - Replaceable Module
  - CRI > 80
  - Universal 120/277 volt standard
  - 5-Year Warranty on LED Components

PLPC-12-LED
Height - 3 ¼"
w/ext ring - 5 ¼"
Diameter - 12"

PLPC-15-LED
Height - 3 ¼"
w/ext ring - 5 ¼"
Diameter - 15"

PLPC-21-LED
Height - 4 3/8"
w/ext ring - 5 ¼"
Diameter - 21¼

WALL | CEILING | PENDANT | OUTDOOR

ORDERING INFORMATION

Example: PLPC-15-LED-U-20W-4-T6-WSA

Model	Cage	Voltage	Lumens/Source	Kelvin	Finish	Diffuser	Options
PLPC-12-LED		**U** 120 - 277	**13w** 1,484 lm (Dim) **10ACw** 1,065 lm (DimLD) **15ACw** 1,724 lm (DimLD	**2** 3000K **4** 4000K	**T6** Pewter **W2** Gloss White **Z1** Satin Bronze **Z3** Text Bronze	**WSA** White Smooth Acrylic **Optional Lens Material** (see Price List) **WSP** White Smooth Polycarbonate	**DIM** LED dimming driver (0 - 10v) *(Included with On Board Driver only)* **DIMLD** Line Voltage /TRIAC/ELV/120v See Resource Page (Included with DirectAC Boards only)
PLPC-15-LED			**20w** 2,325 lm (Dim) **15ACw** 1,724 lm (DimLD) **23ACw** 2,540 lm (DimLD	**Optional** **3** 3500K	**Optional** (see Price List) **W1** Yolk **W3** Text White **B1** Satin Black **B2** Text Black **T4** Shimmer Gray	**WSAHE** White Smooth Acrylic High Efficiency	**OCCHFA** Concealed Occupancy Sensor *See Sensor Resource Sheet*
PLPC-21-LED			**36w** 4,000 lm (Dim)		**M13** Anod Silver **W13** Pearl Beige		**Battery Backup Options** *(Requires 1 ¾" extension ring)* *(On Board Driver Engine only)* **PLPC-15 and 21 only** **BB10** 10 Watts (1170lm) for 90-Minutes

28435 Industry Drive., Valencia, California 91355
West Coast Sales: 800-325-4448 /661-257-0286• fax 800-323-2346 /661-257-0201
East Coast Sales: 866-350-0991 • fax 866-490-5754
www.lightwayind.com • sales@lightwayind.com

GWFW-LED

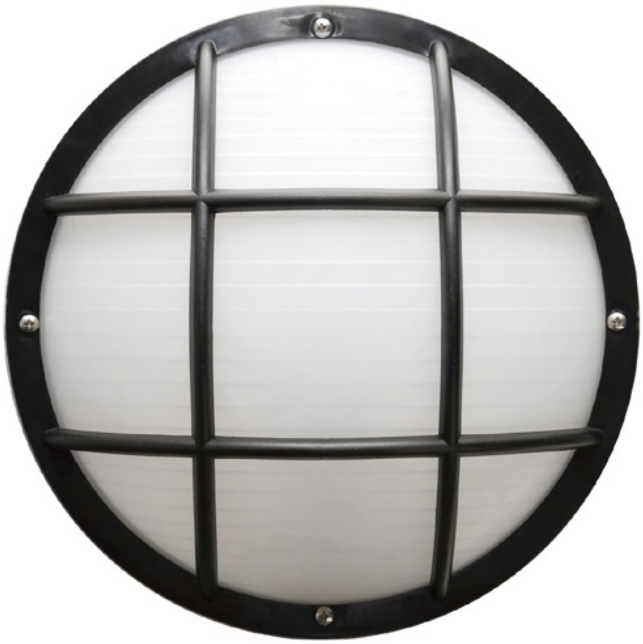
WALL | CEILING | PENDANT | OUTDOOR

Construction:
- Polycarbonate housing
- Diffuser is frosted smooth polycarbonate

Light Source:
- LED
- Line Dimming **Included**

Notes:
- Mounts to standard junction box
- Center lockup
- Vandal Resistant
- UL and CUL listed **WET** location
- LED Components
  - Replaceable Module
  - CRI > 80
  - 120 volt standard
  - 5-Year Warranty on LED Components

Type:	
Job Name:	



GWFW-10
Diameter - 10 ¼"
Depth - 5"

DIMMABLE | c UL us LISTED | MADE IN AMERICA

ORDERING INFORMATION

Example: GWFW-10-LED-A-13W-4-W99-WFP

Model	Cage	Voltage	Lamping	Kelvin	Finish	Diffuser	Options
GWFW-10-LED		**A** 120 Volt	**13w** LED / 900lm **22w** LED / 1800lm	**2** 3000K **4** 4000K	**B99** Black **W99** White	**FSP** Frosted Smooth Polycarbonate	**DIMLD** Line Voltage /TRIAC/ELV/120v See Resource Page

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WPRW-LED

WALL
CEILING
PENDANT
OUTDOOR

Construction:
- Cast aluminum housing & hinged front frame
- Aluminum reflector
- Clear tempered glass lens

Light Source:
- LED

Notes:
- Wall mounting bracket attaches to 4" recessed outlet box
- 1/2" coin plugs for photocell or surface mount conduit
- Optional Photocell – specify voltage
- Optional Battery backup
- Dark Sky compliant
- CSA listed WET location
- LED Components
  - Distributed Array
  - CRI > 80
  - 5-Year Warranty on LED Components

Type:	
Job Name:	

WPRW-9-LED
Height - 9 1/8"
Width - 14 1/4"
Depth - 14 3/4"

WPRW-18-LED
Height - 9 1/8"
Width - 18 1/4"
Depth - 13 3/4"

MADE IN AMERICA

ORDERING INFORMATION

Example: WPRW-18-LED-U-42W-2-Z99-CEG

Model	Cage	Voltage	Lamping	Kelvin	Finish	Diffuser	Options
WPRW-9-LED		**U** 120 - 277	**21w** LED / 2450lm **32w** LED / 3675lm **42w** LED / 4900lm	**2** 3000K **3** 3500K **4** 4000K	**Z99** Bronze	**CEG** Clear Tempered Glass	**21** Photocell - *See Notes* -**01** 120 volt -**02** 277 volt
WPRW-18-LED			**21w** LED / 2450lm **32w** LED / 3675lm **42w** LED / 4900lm				**Battery Backup Options** **BB10** 10 Watts (1170lm) for 90-Minutes

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LITHONIA LIGHTING®

Catalog Number	
Notes	
Type	

FEATURES & SPECIFICATIONS

INTENDED USE

Provides years of maintenance-free illumination for outdoor use in residential & commercial applications. Ideal for applications such as lighting walkways and stairways for safety and security.

CONSTRUCTION

Cast-aluminum housing with corrosion-resistant paint in either dark bronze or white finish.

ADA compliant.

OPTICS

4000K CCT LEDs.

Polycarbonate lens protects the LED from moisture, dirt and other contaminants.

LUMEN MAINTENANCE: The LED will deliver 70% of its initial lumens at 50,000 hour average LED life. See Lighting Facts label on page 2 for performance details.

ELECTRICAL

MVOLT driver operates on any line voltage from 120-277V

Operating temperature -30ºC to 40ºC.

1KV surge protection standard.

INSTALLATION

Surface mounts to universal junction box (provided by others).

LISTINGS

UL Listed to U.S. and Canadian safety standards for wet locations.

Tested in accordance with IESNA LM-79 and LM-80 standards.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Note: Specifications subject to change without notice.

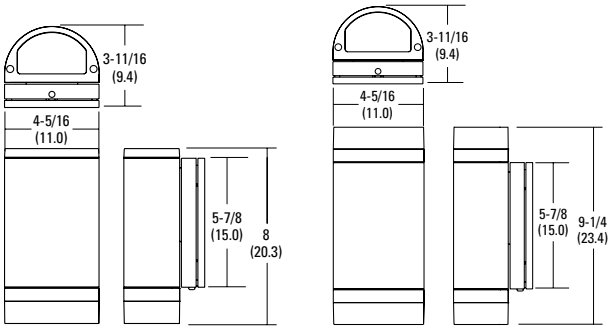
Outdoor General Purpose

OLLWD & OLLWU

LED WALL CYLINDER LIGHT

Specifications

All dimensions are inches (centimeters)



ORDERING INFORMATION For shortest lead times, configure products using **bolded options**.

Example: OLLWD LED P1 40K MVOLT DDB

Series	Performance Package	Color temperature (CCT)	Voltage	Finish
OLLWD LED Downlight **OLLWU LED** Up & downlight	**P1**	**40K** 4000K	**MVOLT** 120V-277V **120** 120V[1]	**DDB** Dark bronze **WH** White

Notes

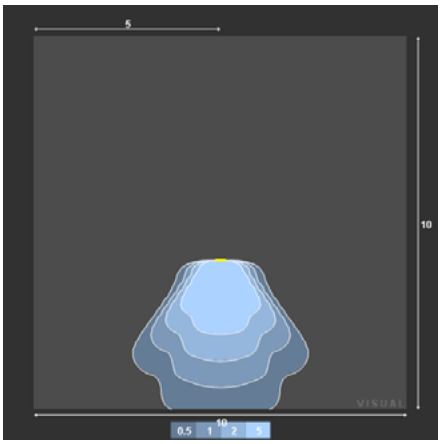
1 Only available with OLLWU and in DDB.

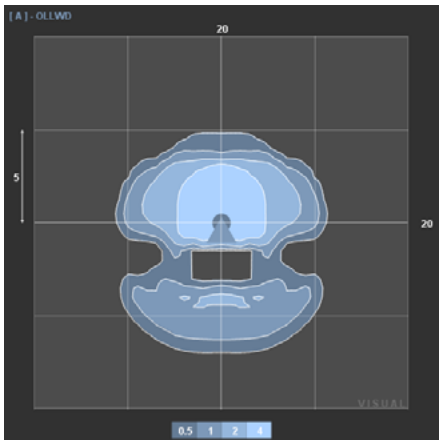
OLLWD & OLLWU LED Wall Cylinder Light

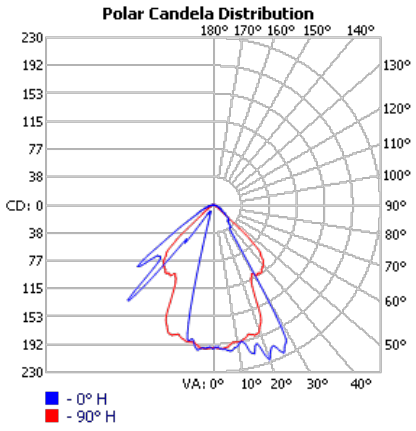
PHOTOMETRICS

To see complete photometric reports or download .ies files for this product,visit Lithonia Lighting's Outdoor LED homepage
Tested in accordance with IESNA LM-79 and LM-80 standards.

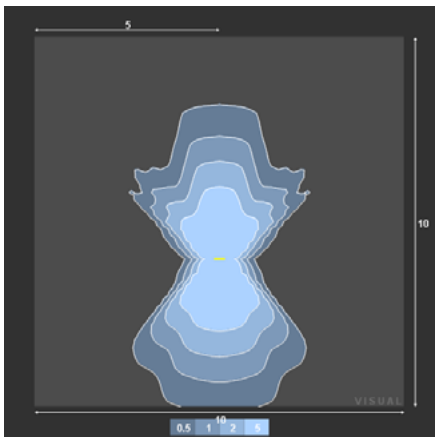
OLLWD

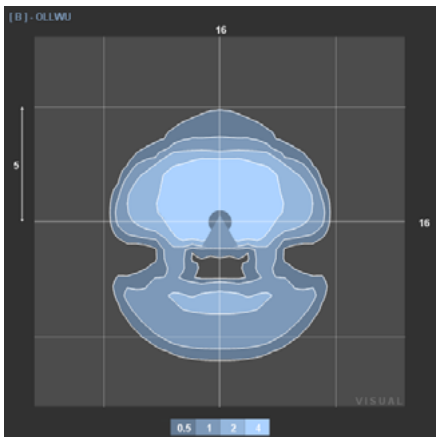


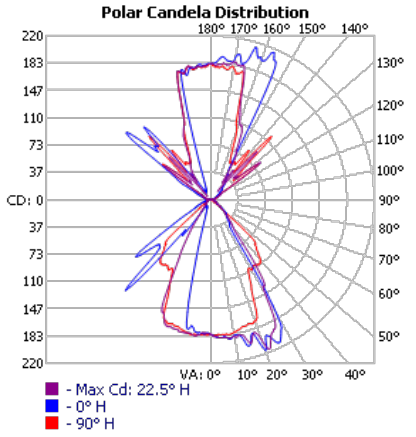




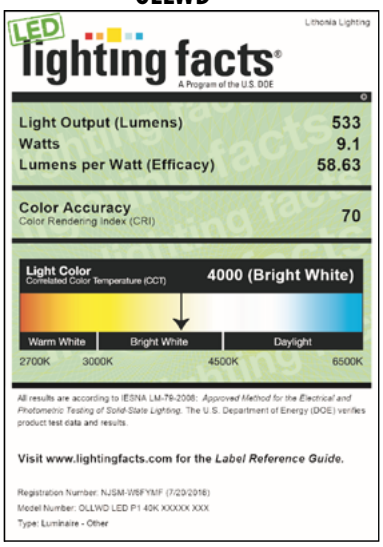
OLLWU



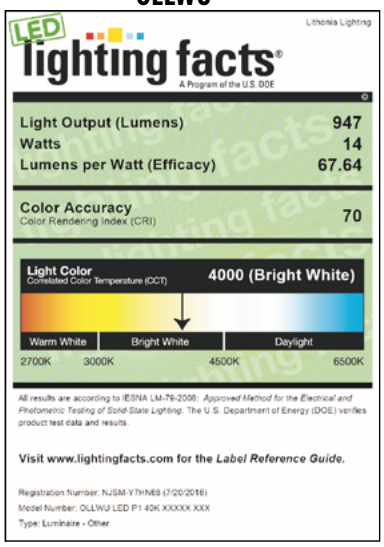




OLLWD



OLLWU



LITHONIA LIGHTING®
An AcuityBrands Company

DECORATIVE INDOOR & OUTDOOR: One Lithonia Way Conyers, GA 30012 Phone: 1-800-279-8041 www.lithonia.com

LUMEC
by signify

Roadway

MiniView

SVS
LED Luminaire (small)

Project:

Location:

Cat.No:

Type:

Lamps: Qty:

Notes:

Lumec **MiniView LED** roadway luminaire is the perfect solution when projects require a luminaire that meets specifications without sacrificing performance, all while maximizing operations and maintenance savings. This roadway luminaire features a single IP66-rated LED module, designed to provide crisp, brilliant white light that surpasses existing HID luminaire performance. Optimized for applications such as local roads and residential streets, its overall size, weight, and tool-free feature ensure ease of installation. MiniView makes upgrading to reliable, long-lasting, low-maintenance LED lighting a simple cost-effective decision for cities, municipalities, and utilities.

Ordering guide

example: SVS-54W16LED4K-G2-LE2-UNV-DMG-PH8-RCD-GY3

Series	LED Module	Board Generation	Optical System	Ballast	Driver Options	Luminaire Options	Finish
SVS MiniView LED roadway luminaire	**3000K** **25W16LED3K** **35W16LED3K** **54W16LED3K** **4000K** **25W16LED4K** **35W16LED4K** **54W16LED4K**	**G2**	**LE2** Type II (ASYM) **LE3** Type III (ASYM)	**UNV** 120-277VAC	**DMG**[1] Dimmable driver 0-10V	**None** (leave blank) **API** Factory installed NEMA label, ANSI C136.15 compliant **HS** House side shield **PH8**[2] Photoelectric cell **PHXL**[2] Photoelectric cell, extended life **PH9**[2] Shorting cap **RCD**[1,3] Receptacle for twist-lock photocell or shorting cap, 5-pin (standard) **RCD7**[3] Receptacle for twist-lock photocell or shorting cap, 7-pin (optional)	**GY3** Grey finish

1. Please note these integrated features come standard with MiniView luminaire.
2. Luminaire option RCD or RCD7 is required with these options.
3. Use of photoelectric cell or shorting cap is required to ensure proper illumination.

SVS MiniView LED (small)

Roadway

LED Wattage and Lumen Values

Ordering Guide	Total LEDs	LED Current (mA)	Average System Watts[1] (W)	Type LE2			Type LE3		
				Delivered lumens[2]	Efficacy LPW	BUG Rating	Delivered lumens[2]	Efficacy LPW	BUG Rating
3000K									
SVS-25W16LED3K-G2	16	470	25	2,561	101.5	B1-U0-G1	2,553	101.2	B1-U0-G1
SVS-35W16LED3K-G2	16	700	36	3,477	95.6	B1-U0-G1	3,483	95.8	B1-U0-G1
SVS-54W16LED3K-G2	16	1050	55	4,776	87.3	B1-U0-G1	4,736	86.6	B1-U0-G1
3000K-HS									
SVS-25W16LED3K-G2-HS	16	470	25	1,977	78.3	B0-U0-G0	1,956	77.5	B0-U0-G0
SVS-35W16LED3K-G2-HS	16	700	36	2,684	73.8	B1-U0-G1	2,669	73.4	B1-U0-G1
SVS-54W16LED3K-G2-HS	16	1050	55	3,687	67.4	B1-U0-G1	3,628	66.3	B1-U0-G1
4000K									
SVS-25W16LED4K-G2	16	470	25	2,945	116.7	B1-U0-G1	2,936	116.4	B1-U0-G1
SVS-35W16LED4K-G2	16	700	36	3,998	110.0	B1-U0-G1	4,005	110.2	B1-U0-G1
SVS-54W16LED4K-G2	16	1050	55	5,492	100.4	B1-U0-G1	5,446	99.6	B1-U0-G1
4000K-HS									
SVS-25W16LED4K-G2-HS	16	470	25	2,273	90.1	B1-U0-G0	2,250	89.2	B1-U0-G1
SVS-35W16LED4K-G2-HS	16	700	36	3,086	84.9	B1-U0-G1	3,069	84.4	B1-U0-G1
SVS-54W16LED4K-G2-HS	16	1050	55	4,240	77.5	B1-U0-G1	4,173	76.3	B1-U0-G1

1. System input wattage may vary based on input voltage by up to +/- 10% and based on manufacturer forward voltage by up to +/- 8%.
2. Lumen values based on photometric tests performed in compliance with IESNA LM-79.

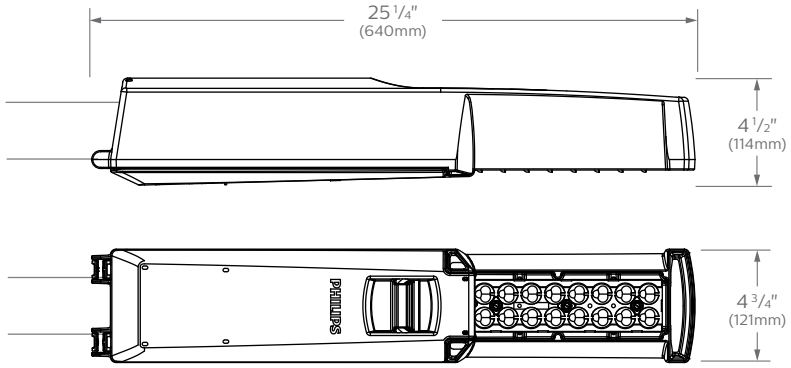
Note: Some data may be scaled based on tests of similar. But not identical luminaires.

Predicted Lumen Depreciation Data

Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions.L_{70} is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published L_{70} hours limited to 6 times actual LED test hours

Ambient Temperature °C	Driver mA	Calculated L_{70} Hours	L_{70} per TM-21	Lumen Maintenance % at 60,000 hrs
Up to 40°C	**up to 1050 mA**	**>100,000 hours**	**>60,000 hours**	**>96%**

Dimensions



EPA: 0.85 sq. ft.

Weight: 25/35W: 7.5 lbs. (3.4 kg)
54W: 8.1 lbs. (3.7 kg)

SVS MiniView LED (small)

Roadway

Specifications

Housing

Made of low copper die cast A360 Aluminum alloy 0.100" (2.5mm) minimum thickness. Fits on a 1.66" (42mm) O.D. (1.25" NPS) or 2 3/8" (60mm) O.D. (2" NPS) by 5 1/4" (133mm) minimum long tenon. Comes with a zinc plated clamp fixed by 2 zinc plated hexagonal bolts 3/8-16 UNC for ease of installation. Provides an easy step adjustment of +/- 5° tilt in 2.5º increments. Includes integral bubble level standard (always included). A quick release, tool less entry, hinged, removable polymeric door opens downward to provide access to electronic components and to a terminal block. Door is secured to prevent accidental dropping or disengagement. A clearance of 8" (203mm) at the rear is required in order to open the door. Complete with a bird guard protecting against birds and similar intruders and an ANSI label to identify wattage and source (both included in box).

Light Engine

Composed of 4 main components: LED Module / Optical System / Heat Sink / Driver.

IP Rating

Electrical components are RoHS compliant, IP66 sealed light engine.

LED Board and Array

LEDs tested by ISO 17025-2005 accredited lab in accordance with IESNA LM-80 guidelines in compliance with EPA ENERGY STAR, extrapolations in accordance with IESNA TM-21. Metal core board ensures greater heat transfer and longer lifespan.

LED Module

Composed of 16 high-performance white LEDs. Color temperature as per ANSI bin 4000 Kelvin nominal (3985K +/- 275K or 3710K to 4260K) or Warm white, 3000 Kelvin nominal (3045K +/- 175K or 2870K to 3220K), , CRI 70 Min. 75 Typical.

Optical System

Composed of high-performance optical grade polymer refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. System is rated IP66. Performance shall be tested per LM-63, LM-79 and TM-15 (IESNA) certifying its photometric performance. 0% uplight and U0 per IESNA TM-15.

LE2 TYPE II Asymmetrical Distribution
LE3 TYPE III Asymmetrical Distribution

Heat Sink

Built-in the housing, the innovative high efficacy heat sink chimney design ensures superior cooling by natural convection air flow pattern always close to LEDs and driver optimizing their efficiency and life. Product does not use any cooling device with moving parts (only passive cooling). Entire luminaire is rated for operation in ambient temperature of -40°C / -40°F up to +40°C / +104°F.

Driver

For 25W and 35W: High power factor of >95%. Electronic driver, operating range 50/60 Hz. Auto-adjusting universal voltage input from 120 to 277 VAC rated for both application line to line or line to neutral, Class II, THD of 12% max.

For 54W: High power factor of 95%. Electronic driver, operating range 50/60 Hz. Auto-adjusting universal voltage input from 120 to 277 VAC rated for both application line to line or line to neutral, Class II, THD of 20% max.

The current supplying the LEDs will be reduced by the driver if the driver experiences internal overheating as a protection to the LEDs and the electrical components. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after correction. Standard built-in driver surge protection of 2.5kV (min).

Vibration Resistance

The SVS meets the ANSI C136.31, American National Standard for Roadway Luminaire Vibration specifications for Bridge/overpass applications. (Tested for 3G over 100 000 cycles by an independent lab).

Integrated Features

RCD: (standard): Receptacle with 5 pins enabling dimming and additional functionality (to be determined), can be used with a twist lock node or photoelectric cell or a shorting cap.

DMG: Dimmable driver 0-10V.

SP1: Surge protection device tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with DOE MSSLC Model Specification for LED roadway luminaires Appendix D Electrical Immunity High test level 10kV/10kA.

Please note that these integrated features always come with MiniView luminaire.

Luminaire Options

RCD7: (optional): Receptacle with 7 pins enabling dimming and additional functionality (to be determined), can be used with a twist lock node or photoelectric cell or a shorting cap.

API: Factory Installed NEMA label, ANSI C136.15 compliant

HS: House side shield

PH8*: Photoelectric cell

PHXL*: Photoelectric cell, extended life

PH9*: Shorting cap

** Luminaire option RCD or RCD7 is required with this accessory.*

Luminaire Useful Life

Refer to IES files for energy consumption and delivered lumens for each option. Based on ISTMT thermal testing in accordance with UL1598 and UL8750, System Reliability Tool, Advance data and LM-80/TM-21 data, expected to reach 100,000+ hours with >L70 lumen maintenance @ 40°C. Luminaire Useful Life accounts for LED lumen maintenance AND all of these additional factors including: LED life, driver life, PCB substrate, solder joints, on/off cycles, burning hours, and corrosion.

Wiring

The connection of the luminaire is done using a terminal block connector 600V, 85A for use with #2-14 AWG. wires from the primary circuit, located inside the housing.

Hardware

All exposed screws shall be zinc with Ceramic primer-seal base coat to reduce seizing of the parts. All seals and sealing devices are made and/or lined with EPDM and/or silicone and/or rubber.

SVS MiniView LED (small)

Roadway

Specifications (continued)

Finish

Color to be medium grey (GY3) and in accordance with the AAMA 2603 standard. Application of a polyester powder coat paint (4 mils/100 microns) with ± 1 mils/24 microns of tolerance. The Thermosetting resins provides a discoloration resistant finish in accordance with the ASTM-D2244 standard, as well as luster retention in keeping with the ASTM-D523 standard and humidity proof in accordance with the ASTM-D2247 standard.

The surface treatment achieves a minimum of 2000 hours for salt spray resistant finish in accordance with testing performed and per ASTM-B117 standard.

LED Products Manufacturing Standard

The electronic components sensitive to electrostatic discharge (ESD) such as light emitting diodes (LEDs) are assembled in compliance with IEC61340-5-1 and ANSI/ESD S20.20 standards so as to eliminate ESD events that could decrease the useful life of the product.

Certifications and Compliance

cULus Listed for Canada and USA. Luminaire complies with DOE MSSLC Model Specification for LED Roadway Luminaires. MiniView is on the DesignLights Consortium (DLC) Qualified Products List (QPL).

Limited Warranty

10-year limited warranty.
See **signify.com/warranties** for details and restrictions.

Brackets/Arms

For brackets / arms available with this luminaire, see Lumec 3D for details.

Signify North America Corporation
200 Franklin Square Drive,
Somerset, NJ 08873
Telephone 855-486-2216

Signify Canada Ltd.
281 Hillmount Road,
Markham, ON, Canada L6C 2S3
Telephone 800-668-9008

D-Series Size 0
LED Area Luminaire

Catalog Number

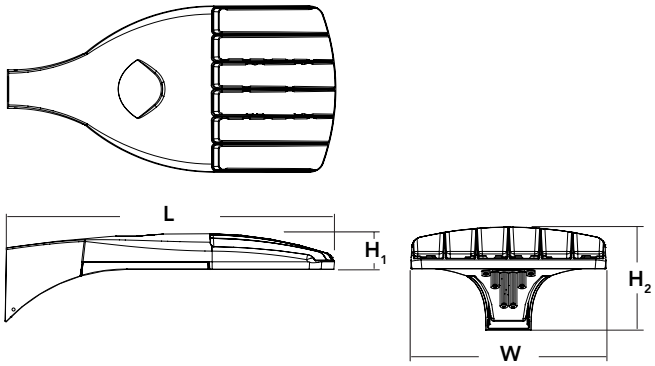
Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

EPA:	0.95 ft² (.09 m²)
Length:	26" (66.0 cm)
Width:	13" (33.0 cm)
Height$_1$:	3" (7.62 cm)
Height$_2$:	7" (17.8 cm)
Weight (max):	16 lbs (7.25 kg)



Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 70% and expected service life of over 100,000 hours.

A+ Capable options indicated by this color background.

Ordering Information

EXAMPLE: DSX0 LED P6 40K T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX0 LED

Series

DSX0 LED

LEDs

Forward optics

P1 P4 P7
P2 P5
P3 P6

Rotated optics

P10[1] P12[1]
P11[1] P13[1]

Color temperature

30K	3000 K
40K	4000 K
50K	5000 K

Distribution

T1S	Type I short	T5S	Type V short
T2S	Type II short	T5M	Type V medium
T2M	Type II medium	T5W	Type V wide
T3S	Type III short	BLC	Backlight control[2]
T3M	Type III medium	LCCO	Left corner cutoff[2]
T4M	Type IV medium	RCCO	Right corner cutoff[2]
TFTM	Forward throw medium		
T5VS	Type V very short		

Voltage

MVOLT [3,4]
120 [4]
208 [4]
240 [4]
277 [4]
347 [4,5]
480 [4,5]

Mounting

Shipped included

SPA	Square pole mounting
RPA	Round pole mounting
WBA	Wall bracket
SPUMBA	Square pole universal mounting adaptor [6]
RPUMBA	Round pole universal mounting adaptor [6]

Shipped separately

KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish)[7]

Control options

Shipped installed

NLTAIR2	nLight AIR generation 2 enabled[8,9]
PIRHN	Network, high/low motion/ambient sensor[10]
PER	NEMA twist-lock receptacle only (control ordered separate) [11]
PER5	Five-pin receptacle only (control ordered separate) [11,12]
PER7	Seven-pin receptacle only (leads exit fixture) (control ordered separate) [11,12]
DMG	0-10V dimming extend out back of housing for external control (control ordered separate)
PIR	High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc [13,14]
PIRH	High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 5fc [13,14]
PIR1FC3V	High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc [13,14]
PIRH1FC3V	High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc [13,14]
FAO	Field adjustable output [15]

Other options

Shipped installed

HS	House-side shield [16]
SF	Single fuse (120, 277, 347V) [4]
DF	Double fuse (208, 240, 480V) [4]
L90	Left rotated optics [1]
R90	Right rotated optics [1]
DDL	Diffused drop lens [16]

Shipped separately

BS	Bird spikes [17]
EGS	External glare shield [17]

Finish *(required)*

DDBXD	Dark bronze
DBLXD	Black
DNAXD	Natural aluminum
DWHXD	White
DDBTXD	Textured dark bronze
DBLBXD	Textured black
DNATXD	Textured natural aluminum
DWHGXD	Textured white

Ordering Information

Accessories

Ordered and shipped separately.

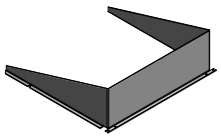
DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) [18]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) [18]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) [18]
DSHORT SBK U	Shorting cap [18]
DSX0HS 20C U	House-side shield for P1,P2,P3 and P4 [16]
DSX0HS 30C U	House-side shield for P10,P11,P12 and P13 [16]
DSX0HS 40C U	House-side shield for P5,P6 AND P7 [16]
DSX0DDL U	Diffused drop lens (polycarbonate) [16]
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish) [19]
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) [6]

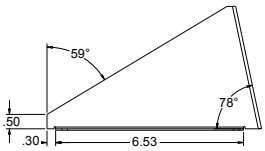
For more control options, visit DTL and ROAM online. Link to nLight Air 2

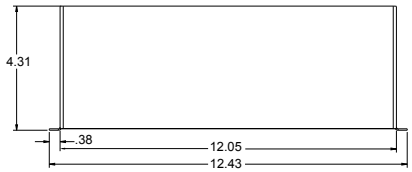
NOTES

1 P10, P11, P12 and P13 and rotated options (L90 or R90) only available together.
2 Not available with HS or DDL.
3 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
4 Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
5 Not available in P4, P7 or P13. Not available with BL30, BL50 or PNMT options.
6 Universal mounting brackets intended for retrofit on existing pre-drilled poles only. 1.5 G vibration load rating per ANCI C136.31.
7 Must order fixture with SPA mounting. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" mast arm (not included).
8 Must be ordered with PIRHN.
9 Sensor cover available only in dark bronze, black, white and natural aluminum colors.
10 Must be ordered with NLTAIR2. For more information on nLight Air 2 visit this link
11 Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Shorting Cap included.
12 If ROAM® node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Shorting Cap included.
13 Reference Motion Sensor table on page 3.
14 Reference PER Table on page 3 to see functionality.
15 Not available with other dimming controls options.
16 Not available with BLC, LCCO and RCCO distribution.
17 Must be ordered with fixture for factory pre-drilling.
18 Requires luminaire to be specified with PER, PER5 or PER7 option. See PER Table on page 3.
19 For retrofit use only.

EGS – External Glare Shield

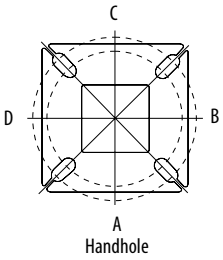




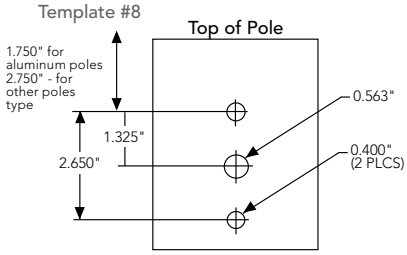


Drilling

HANDHOLE ORIENTATION
(from top of pole)



Template #8



Tenon Mounting Slipfitter

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

							
Mounting Option	**Drilling Template**	**Single**	**2 @ 180**	**2 @ 90**	**3 @ 90**	**3 @ 120**	**4 @ 90**
Head Location		Side B	Side B & D	Side B & C	Side B, C & D	Round Pole Only	Side A, B, C & D
Drill Nomenclature	#8	DM19AS	DM28AS	DM29AS	DM39AS	DM32AS	DM49AS
		Minimum Acceptable Outside Pole Dimension					
SPA	#8	2-7/8"	2-7/8"	3.5"	3.5"		3.5"
RPA	#8	2-7/8"	2-7/8"	3.5"	3.5"	3"	3.5"
SPUMBA	#5	2-7/8"	3"	4"	4"		4"
RPUMBA	#5	2-7/8"	3.5"	5"	5"	3.5"	5"

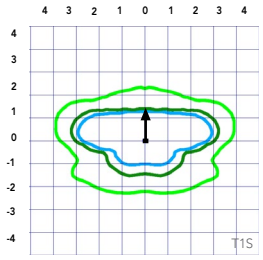
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Area Size 0 homepage.

Isofootcandle plots for the DSX0 LED 40C 1000 40K. Distances are in units of mounting height (20').

LEGEND

- 0.1 fc
- 0.5 fc
- 1.0 fc



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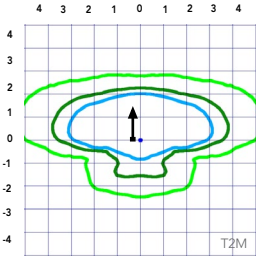

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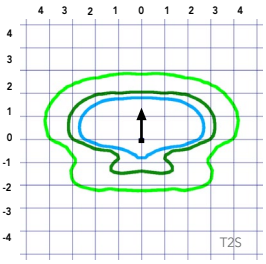
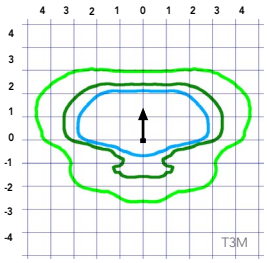


Test No. LTL23457P25 tested in accordance with IESNA LM-79-08.



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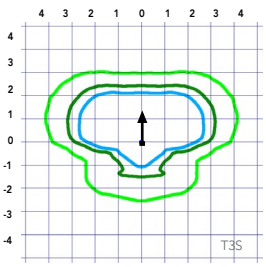

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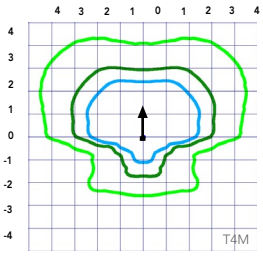

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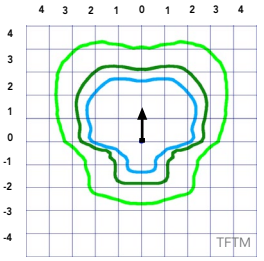

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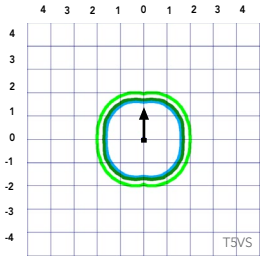

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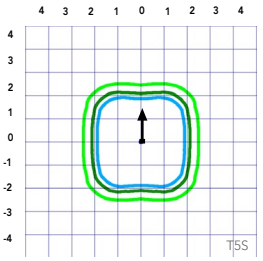

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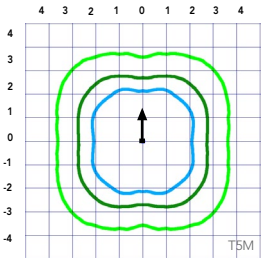

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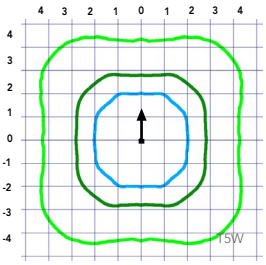

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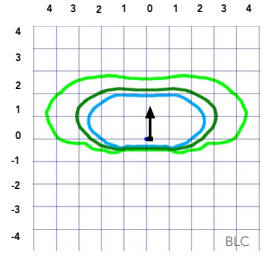

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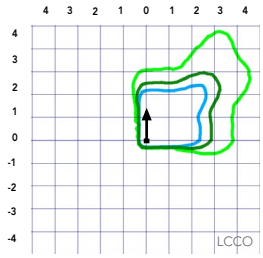

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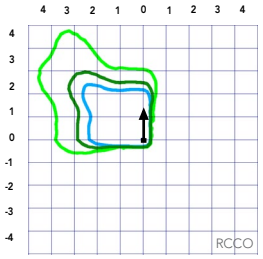


Test No.

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.04
5°C	41°F	1.04
10°C	50°F	1.03
15°C	50°F	1.02
20°C	68°F	1.01
25°C	**77°C**	**1.00**
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.97

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	Lumen Maintenance Factor
25,000	0.96
50,000	0.92
100,000	0.85

Motion Sensor Default Settings						
Option	Dimmed State	High Level (when triggered)	Photocell Operation	Dwell Time	Ramp-up Time	Ramp-down Time
PIR or PIRH	3V (37%) Output	10V (100%) Output	Enabled @ 5FC	5 min	3 sec	5 min
*PIR1FC3V or PIRH1FC3V	3V (37%) Output	10V (100%) Output	Enabled @ 1FC	5 min	3 sec	5 min
*for use with separate Dusk to Dawn or timer.						

Electrical Load

					Current (A)					
	Performance Package	LED Count	Drive Current	Wattage	120	208	240	277	347	480
Forward Optics (Non-Rotated)	P1	20	530	38	0.32	0.18	0.15	0.15	0.10	0.08
	P2	20	700	49	0.41	0.23	0.20	0.19	0.14	0.11
	P3	20	1050	71	0.60	0.37	0.32	0.27	0.21	0.15
	P4	20	1400	92	0.77	0.45	0.39	0.35	0.28	0.20
	P5	40	700	89	0.74	0.43	0.38	0.34	0.26	0.20
	P6	40	1050	134	1.13	0.65	0.55	0.48	0.39	0.29
	P7	40	1300	166	1.38	0.80	0.69	0.60	0.50	0.37
Rotated Optics (Requires L90 or R90)	P10	30	530	53	0.45	0.26	0.23	0.21	0.16	0.12
	P11	30	700	72	0.60	0.35	0.30	0.27	0.20	0.16
	P12	30	1050	104	0.88	0.50	0.44	0.39	0.31	0.23
	P13	30	1300	128	1.08	0.62	0.54	0.48	0.37	0.27

Controls Options

Nomenclature	Descripton	Functionality	Primary control device	Notes
FAO	Field adjustable output device installed inside the lumiaire; wired to the driver dimming leads.	Allows the lumiaire to be manually dimmed, effectively trimming the light output.	FAO device	Cannot be used with other controls options that need the 0-10V leads
DS	Drivers wired independantly for 50/50 luminaire operation	The luminaire is wired to two separate circuits, allowing for 50/50 operation.	Independently wired drivers	Requires two seperately switched circuits. Consider nLight AIR as a more cost effective alternative.
PER5 or PER7	Twist-lock photocell receptacle	Compatible with standard twist-lock photocells for dusk to dawn operation, or advanced control nodes that provide 0-10V dimming signals.	Twist-lock photocells such as DLL Elite or advanced control nodes such as ROAM.	Pins 4 & 5 to dimming leads on driver, Pins 6 & 7 are capped inside luminaire
PIR or PIRH	Motion sensors with integral photocell. PIR for 8-15' mounting; PIRH for 15-30' mounting	Luminaires dim when no occupancy is detected.	Acuity Controls SBOR	Also available with PIRH1FC3V when the sensor photocell is used for dusk-to-dawn operation.
NLTAIR2 PIRHN	nLight AIR enabled luminaire for motion sensing, photocell and wireless communication.	Motion and ambient light sensing with group response. Scheduled dimming with motion sensor over-ride when wirelessly connected to the nLight Eclypse.	nLight Air rSDGR	nLight AIR sensors can be programmed and commissioned from the ground using the CIAIRity Pro app.

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics

Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	20	530	38W	T1S	4,369	1	0	1	115	4,706	1	0	1	124	4,766	1	0	1	125
				T2S	4,364	1	0	1	115	4,701	1	0	1	124	4,761	1	0	1	125
				T2M	4,387	1	0	1	115	4,726	1	0	1	124	4,785	1	0	1	126
				T3S	4,248	1	0	1	112	4,577	1	0	1	120	4,634	1	0	1	122
				T3M	4,376	1	0	1	115	4,714	1	0	1	124	4,774	1	0	1	126
				T4M	4,281	1	0	1	113	4,612	1	0	2	121	4,670	1	0	2	123
				TFTM	4,373	1	0	1	115	4,711	1	0	2	124	4,771	1	0	2	126
				T5VS	4,548	2	0	0	120	4,900	2	0	0	129	4,962	2	0	0	131
				T5S	4,552	2	0	0	120	4,904	2	0	0	129	4,966	2	0	0	131
				T5M	4,541	3	0	1	120	4,891	3	0	1	129	4,953	3	0	1	130
				T5W	4,576	3	0	2	120	4,929	3	0	2	130	4,992	3	0	2	131
				BLC	3,586	1	0	1	94	3,863	1	0	1	102	3,912	1	0	1	103
				LCCO	2,668	1	0	1	70	2,874	1	0	2	76	2,911	1	0	2	77
				RCCO	2,668	1	0	1	70	2,874	1	0	2	76	2,911	1	0	2	77
P2	20	700	49W	T1S	5,570	1	0	1	114	6,001	1	0	1	122	6,077	2	0	2	124
				T2S	5,564	1	0	2	114	5,994	1	0	2	122	6,070	2	0	2	124
				T2M	5,593	1	0	1	114	6,025	1	0	1	123	6,102	1	0	1	125
				T3S	5,417	1	0	2	111	5,835	1	0	2	119	5,909	2	0	2	121
				T3M	5,580	1	0	2	114	6,011	1	0	2	123	6,087	1	0	2	124
				T4M	5,458	1	0	2	111	5,880	1	0	2	120	5,955	1	0	2	122
				TFTM	5,576	1	0	2	114	6,007	1	0	2	123	6,083	1	0	2	124
				T5VS	5,799	2	0	0	118	6,247	2	0	0	127	6,327	2	0	0	129
				T5S	5,804	2	0	0	118	6,252	2	0	0	128	6,332	2	0	1	129
				T5M	5,789	3	0	1	118	6,237	3	0	1	127	6,316	3	0	1	129
				T5W	5,834	3	0	2	119	6,285	3	0	2	128	6,364	3	0	2	130
				BLC	4,572	1	0	1	93	4,925	1	0	1	101	4,987	1	0	1	102
				LCCO	3,402	1	0	2	69	3,665	1	0	2	75	3,711	1	0	2	76
				RCCO	3,402	1	0	2	69	3,665	1	0	2	75	3,711	1	0	2	76
P3	20	1050	71W	T1S	7,833	2	0	2	110	8,438	2	0	2	119	8,545	2	0	2	120
				T2S	7,825	2	0	2	110	8,429	2	0	2	119	8,536	2	0	2	120
				T2M	7,865	2	0	2	111	8,473	2	0	2	119	8,580	2	0	2	121
				T3S	7,617	2	0	2	107	8,205	2	0	2	116	8,309	2	0	2	117
				T3M	7,846	2	0	2	111	8,452	2	0	2	119	8,559	2	0	2	121
				T4M	7,675	2	0	2	108	8,269	2	0	2	116	8,373	2	0	2	118
				TFTM	7,841	2	0	2	110	8,447	2	0	2	119	8,554	2	0	2	120
				T5VS	8,155	3	0	0	115	8,785	3	0	0	124	8,896	3	0	0	125
				T5S	8,162	3	0	1	115	8,792	3	0	1	124	8,904	3	0	1	125
				T5M	8,141	3	0	2	115	8,770	3	0	2	124	8,881	3	0	2	125
				T5W	8,204	3	0	2	116	8,838	4	0	2	124	8,950	4	0	2	126
				BLC	6,429	1	0	2	91	6,926	1	0	2	98	7,013	1	0	2	99
				LCCO	4,784	1	0	2	67	5,153	1	0	2	73	5,218	1	0	2	73
				RCCO	4,784	1	0	2	67	5,153	1	0	2	73	5,218	1	0	2	73
P4	20	1400	92W	T1S	9,791	2	0	2	106	10,547	2	0	2	115	10,681	2	0	2	116
				T2S	9,780	2	0	2	106	10,536	2	0	2	115	10,669	2	0	2	116
				T2M	9,831	2	0	2	107	10,590	2	0	2	115	10,724	2	0	2	117
				T3S	9,521	2	0	2	103	10,256	2	0	2	111	10,386	2	0	2	113
				T3M	9,807	2	0	2	107	10,565	2	0	2	115	10,698	2	0	2	116
				T4M	9,594	2	0	2	104	10,335	2	0	3	112	10,466	2	0	3	114
				TFTM	9,801	2	0	2	107	10,558	2	0	2	115	10,692	2	0	2	116
				T5VS	10,193	3	0	1	111	10,981	3	0	1	119	11,120	3	0	1	121
				T5S	10,201	3	0	1	111	10,990	3	0	1	119	11,129	3	0	1	121
				T5M	10,176	4	0	2	111	10,962	4	0	2	119	11,101	4	0	2	121
				T5W	10,254	4	0	3	111	11,047	4	0	3	120	11,186	4	0	3	122
				BLC	8,036	1	0	2	87	8,656	1	0	2	94	8,766	1	0	2	95
				LCCO	5,979	1	0	2	65	6,441	1	0	2	70	6,523	1	0	3	71
					5,979	1	0	2	65	6,441	1	0	2	70	6,523	1	0	3	71

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics

Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P5	40	700	89W	T1S	10,831	2	0	2	122	11,668	2	0	2	131	11,816	2	0	2	133
				T2S	10,820	2	0	2	122	11,656	2	0	2	131	11,803	2	0	2	133
				T2M	10,876	2	0	2	122	11,716	2	0	2	132	11,864	2	0	2	133
				T3S	10,532	2	0	2	118	11,346	2	0	2	127	11,490	2	0	2	129
				T3M	10,849	2	0	2	122	11,687	2	0	2	131	11,835	2	0	2	133
				T4M	10,613	2	0	3	119	11,434	2	0	3	128	11,578	2	0	3	130
				TFTM	10,842	2	0	2	122	11,680	2	0	2	131	11,828	2	0	2	133
				T5VS	11,276	3	0	1	127	12,148	3	0	1	136	12,302	3	0	1	138
				T5S	11,286	3	0	1	127	12,158	3	0	1	137	12,312	3	0	1	138
				T5M	11,257	4	0	2	126	12,127	4	0	2	136	12,280	4	0	2	138
				T5W	11,344	4	0	3	127	12,221	4	0	3	137	12,375	4	0	3	139
				BLC	8,890	1	0	2	100	9,576	1	0	2	108	9,698	1	0	2	109
				LCCO	6,615	1	0	3	74	7,126	1	0	3	80	7,216	1	0	3	81
				RCCO	6,615	1	0	3	74	7,126	1	0	3	80	7,216	1	0	3	81
P6	40	1050	134W	T1S	14,805	3	0	3	110	15,949	3	0	3	119	16,151	3	0	3	121
				T2S	14,789	3	0	3	110	15,932	3	0	3	119	16,134	3	0	3	120
				T2M	14,865	3	0	3	111	16,014	3	0	3	120	16,217	3	0	3	121
				T3S	14,396	3	0	3	107	15,509	3	0	3	116	15,705	3	0	3	117
				T3M	14,829	2	0	3	111	15,975	3	0	3	119	16,177	3	0	3	121
				T4M	14,507	2	0	3	108	15,628	3	0	3	117	15,826	3	0	3	118
				TFTM	14,820	2	0	3	111	15,965	3	0	3	119	16,167	3	0	3	121
				T5VS	15,413	4	0	1	115	16,604	4	0	1	124	16,815	4	0	1	125
				T5S	15,426	3	0	1	115	16,618	4	0	1	124	16,828	4	0	1	126
				T5M	15,387	4	0	2	115	16,576	4	0	2	124	16,786	4	0	2	125
				T5W	15,506	4	0	3	116	16,704	4	0	3	125	16,915	4	0	3	126
				BLC	12,151	1	0	2	91	13,090	1	0	2	98	13,255	1	0	2	99
				LCCO	9,041	1	0	3	67	9,740	1	0	3	73	9,863	1	0	3	74
				RCCO	9,041	1	0	3	67	9,740	1	0	3	73	9,863	1	0	3	74
P7	40	1300	166W	T1S	17,023	3	0	3	103	18,338	3	0	3	110	18,570	3	0	3	112
				T2S	17,005	3	0	3	102	18,319	3	0	3	110	18,551	3	0	3	112
				T2M	17,092	3	0	3	103	18,413	3	0	3	111	18,646	3	0	3	112
				T3S	16,553	3	0	3	100	17,832	3	0	3	107	18,058	3	0	3	109
				T3M	17,051	3	0	3	103	18,369	3	0	3	111	18,601	3	0	3	112
				T4M	16,681	3	0	3	100	17,969	3	0	3	108	18,197	3	0	3	110
				TFTM	17,040	3	0	3	103	18,357	3	0	4	111	18,590	3	0	4	112
				T5VS	17,723	4	0	1	107	19,092	4	0	1	115	19,334	4	0	1	116
				T5S	17,737	4	0	2	107	19,108	4	0	2	115	19,349	4	0	2	117
				T5M	17,692	4	0	2	107	19,059	4	0	2	115	19,301	4	0	2	116
				T5W	17,829	5	0	3	107	19,207	5	0	3	116	19,450	5	0	3	117
				BLC	13,971	2	0	2	84	15,051	2	0	2	91	15,241	2	0	2	92
				LCCO	10,396	1	0	3	63	11,199	1	0	3	67	11,341	1	0	3	68
					10,396	1	0	3	63	11,199	1	0	3	67	11,341	1	0	3	68

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Rotated Optics

Power Package	LED Count	Drive Current	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)				
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P10	30	530	53W	T1S	6,727	2	0	2	127	7,247	3	0	3	137	7,339	3	0	3	138
				T2S	6,689	3	0	3	126	7,205	3	0	3	136	7,297	3	0	3	138
				T2M	6,809	3	0	3	128	7,336	3	0	3	138	7,428	3	0	3	140
				T3S	6,585	3	0	3	124	7,094	3	0	3	134	7,183	3	0	3	136
				T3M	6,805	3	0	3	128	7,331	3	0	3	138	7,424	3	0	3	140
				T4M	6,677	3	0	3	126	7,193	3	0	3	136	7,284	3	0	3	137
				TFTM	6,850	3	0	3	129	7,379	3	0	3	139	7,472	3	0	3	141
				T5VS	6,898	3	0	0	130	7,431	3	0	0	140	7,525	3	0	0	142
				T5S	6,840	2	0	1	129	7,368	2	0	1	139	7,461	2	0	1	141
				T5M	6,838	3	0	1	129	7,366	3	0	2	139	7,460	3	0	2	141
				T5W	6,777	3	0	2	128	7,300	3	0	2	138	7,393	3	0	2	139
				BLC	5,626	2	0	2	106	6,060	2	0	2	114	6,137	2	0	2	116
				LCCO	4,018	1	0	2	76	4,328	1	0	2	82	4,383	1	0	2	83
				RCCO	4,013	3	0	3	76	4,323	3	0	3	82	4,377	3	0	3	83
P11	30	700	72W	T1S	8,594	3	0	3	119	9,258	3	0	3	129	9,376	3	0	3	130
				T2S	8,545	3	0	3	119	9,205	3	0	3	128	9,322	3	0	3	129
				T2M	8,699	3	0	3	121	9,371	3	0	3	130	9,490	3	0	3	132
				T3S	8,412	3	0	3	117	9,062	3	0	3	126	9,177	3	0	3	127
				T3M	8,694	3	0	3	121	9,366	3	0	3	130	9,484	3	0	3	132
				T4M	8,530	3	0	3	118	9,189	3	0	3	128	9,305	3	0	3	129
				TFTM	8,750	3	0	3	122	9,427	3	0	3	131	9,546	3	0	3	133
				T5VS	8,812	3	0	0	122	9,493	3	0	0	132	9,613	3	0	0	134
				T5S	8,738	3	0	1	121	9,413	3	0	1	131	9,532	3	0	1	132
				T5M	8,736	3	0	2	121	9,411	3	0	2	131	9,530	3	0	2	132
				T5W	8,657	4	0	2	120	9,326	4	0	2	130	9,444	4	0	2	131
				BLC	7,187	3	0	3	100	7,742	3	0	3	108	7,840	3	0	3	109
				LCCO	5,133	1	0	2	71	5,529	1	0	2	77	5,599	1	0	2	78
				RCCO	5,126	3	0	3	71	5,522	3	0	3	77	5,592	3	0	3	78
P12	30	1050	104W	T1S	12,149	3	0	3	117	13,088	3	0	3	126	13,253	3	0	3	127
				T2S	12,079	4	0	4	116	13,012	4	0	4	125	13,177	4	0	4	127
				T2M	12,297	3	0	3	118	13,247	3	0	3	127	13,415	3	0	3	129
				T3S	11,891	4	0	4	114	12,810	4	0	4	123	12,972	4	0	4	125
				T3M	12,290	3	0	3	118	13,239	4	0	4	127	13,407	4	0	4	129
				T4M	12,058	4	0	4	116	12,990	4	0	4	125	13,154	4	0	4	126
				TFTM	12,369	4	0	4	119	13,325	4	0	4	128	13,494	4	0	4	130
				T5VS	12,456	3	0	1	120	13,419	3	0	1	129	13,589	4	0	1	131
				T5S	12,351	3	0	1	119	13,306	3	0	1	128	13,474	3	0	1	130
				T5M	12,349	4	0	2	119	13,303	4	0	2	128	13,471	4	0	2	130
				T5W	12,238	4	0	3	118	13,183	4	0	3	127	13,350	4	0	3	128
				BLC	10,159	3	0	3	98	10,944	3	0	3	105	11,083	3	0	3	107
				LCCO	7,256	1	0	3	70	7,816	1	0	3	75	7,915	1	0	3	76
				RCCO	7,246	3	0	3	70	7,806	4	0	4	75	7,905	4	0	4	76
P13	30	1300	128W	T1S	14,438	3	0	3	113	15,554	3	0	3	122	15,751	3	0	3	123
				T2S	14,355	4	0	4	112	15,465	4	0	4	121	15,660	4	0	4	122
				T2M	14,614	3	0	3	114	15,744	4	0	4	123	15,943	4	0	4	125
				T3S	14,132	4	0	4	110	15,224	4	0	4	119	15,417	4	0	4	120
				T3M	14,606	4	0	4	114	15,735	4	0	4	123	15,934	4	0	4	124
				T4M	14,330	4	0	4	112	15,438	4	0	4	121	15,633	4	0	4	122
				TFTM	14,701	4	0	4	115	15,836	4	0	4	124	16,037	4	0	4	125
				T5VS	14,804	4	0	1	116	15,948	4	0	1	125	16,150	4	0	1	126
				T5S	14,679	3	0	1	115	15,814	3	0	1	124	16,014	3	0	1	125
				T5M	14,676	4	0	2	115	15,810	4	0	2	124	16,010	4	0	2	125
				T5W	14,544	4	0	3	114	15,668	4	0	3	122	15,866	4	0	3	124
				BLC	7919	3	0	3	62	8531	3	0	3	67	8639	3	0	3	67
				LCCO	5145	1	0	2	40	5543	1	0	2	43	5613	1	0	2	44
					5139	3	0	3	40	5536	3	0	3	43	5606	3	0	3	44

A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability1
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background[1]

To learn more about A+, visit www.acuitybrands.com/aplus.

1. See ordering tree for details.
2. A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire. Sold Separately: Link to Roam; Link to DTL DLL

FEATURES & SPECIFICATIONS

INTENDED USE

The sleek design of the D-Series Size 0 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and pedestrian areas.

CONSTRUCTION

Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (0.95 ft^2) for optimized pole wind loading.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

OPTICS

Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in 3000 K, 4000 K or 5000 K (70 CRI) configurations. The D-Series Size 0 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engine(s) configurations consist of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L85/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

STANDARD CONTROLS

The DSX0 LED area luminaire has a number of control options. Dusk to dawn controls can be utilized via optional NEMA twist-lock photocell receptacles. Integrated motion sensors with on-board photocells feature field-adjustable programing and are suitable for mounting heights up to 30 feet.

nLIGHT AIR CONTROLS

The DSX0 LED area luminaire is also available with nLight® AIR for the ultimate in wireless control. This powerful controls platform provides out-of-the-box basic motion sensing and photocontrol functionality and is suitable for mounting heights up to 40 feet. Once commissioned using a smartphone and the easy-to-use CLAIRITY app, nLight AIR equipped luminaries can be grouped, resulting in motion sensor and photocell group response without the need for additional equipment. Scheduled dimming with motion sensor over-ride can be achieved when used with the nLight Eclypse. Additional information about nLight Air can be found here.

INSTALLATION

Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 0 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 0 utilizes the AERIS™ series pole drilling pattern (template #8). Optional terminal block and NEMA photocontrol receptacle are also available.

LISTINGS

UL Listed for wet locations. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only.

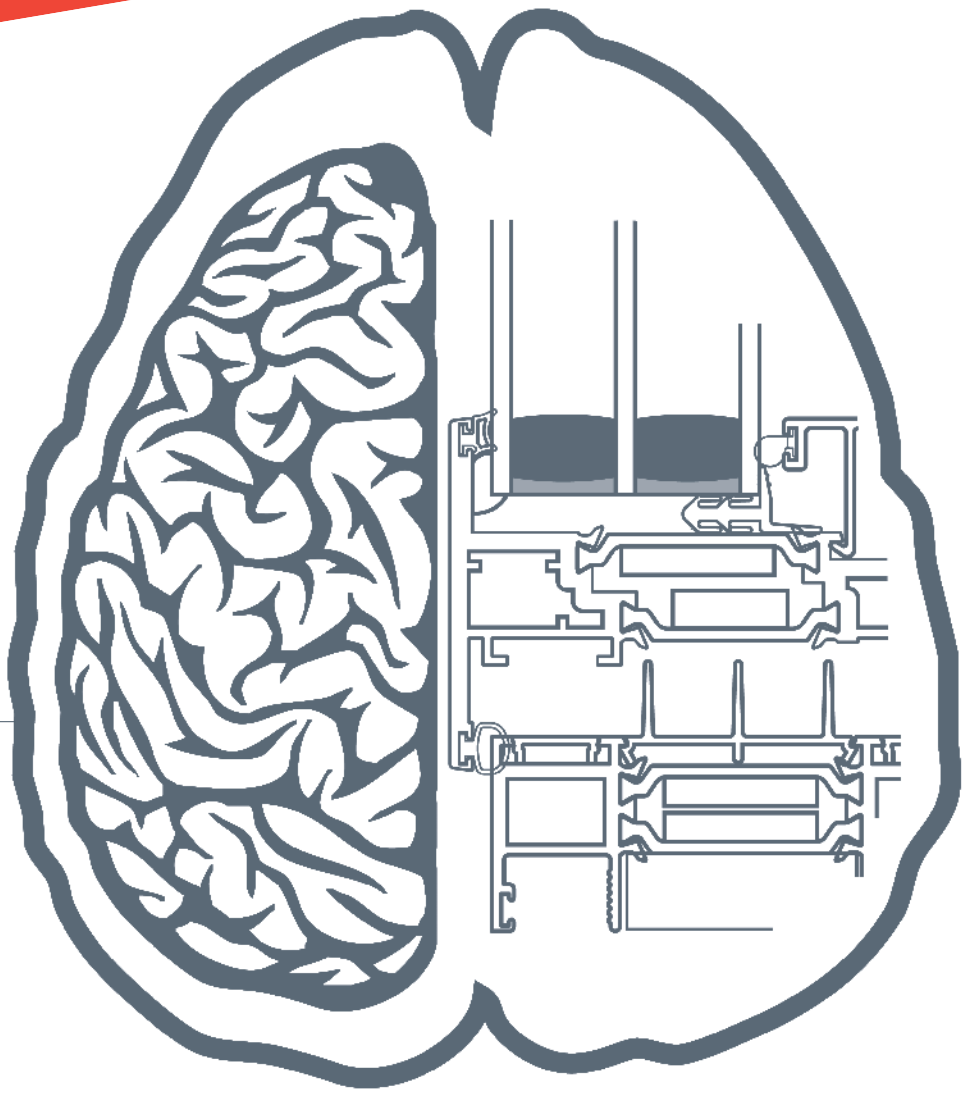
WARRANTY

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/resources/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25 °C.
Specifications subject to change without notice.

OptiQ™ AA™4325 Series Windows

The industry's smartest window achieves a new level in thermal performance.



THERMAL INTELLIGENCE

The tradition of offering innovative products continues with the introduction of OptiQ™ Ultra Thermal Windows. Built-in thermal intelligence makes it the industry's smartest window. The result of a pioneering partnership with the U.S. Department of Energy, the AA™4325 series – the first OptiQ™ Window – reaches a new level in thermal performance due to the unique features integrated into its design. This thermal intelligence allows the AA™4325 series to maintain thermal continuity, reduce thermal transmission and help retain interior heat.

As energy codes become increasingly stringent, high-performing building products are a requirement rather than a luxury. The AA™4325 series meets or exceeds the minimum requirements for Architectural Window performance class including life cycle testing. Since it is made from aluminum, this ultra thermal window will never rot, warp or buckle due to moisture and weather exposure. With groundbreaking design features and multiple options for customization, the intelligence of OptiQ™ Windows is truly built into the details.

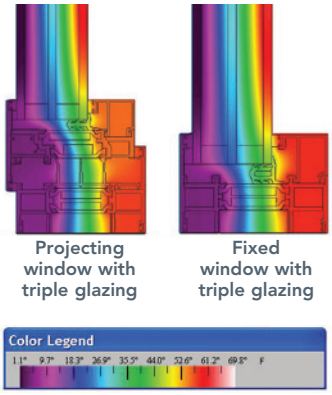
KAWNEER
AN ARCONIC COMPANY

Performance

With its best-in-class thermal performance, OptiQ™ Windows set new industry standards for thermal intelligence.

The AA™4325 series features a polyamide thermal break that allows it to achieve higher thermal performance than the traditional pour and debridged (P&D) style thermal break. Performance is further enhanced by accommodating 1" and 1-3/4" insulating glass. In addition, alignment of the insulating glass unit (IGU) with the thermal break allows the window to maintain thermal continuity. Reduced sightlines also decrease thermal conductivity and transfer, while wider thermal break profiles allow for increased space between interior and exterior metal.

Thermal simulations showing temperature variations from exterior/ cold side to interior/warm side.



Projecting window with triple glazing

Fixed window with triple glazing

Thermal transmission is further reduced by a unique center fin gasket design, the use of insulating foam strips and the ability to accommodate 1-3/4" triple glazing. The window also achieves outstanding condensation resistance, making it ideal for applications like hospitals and schools where condensation and mold are significant concerns.

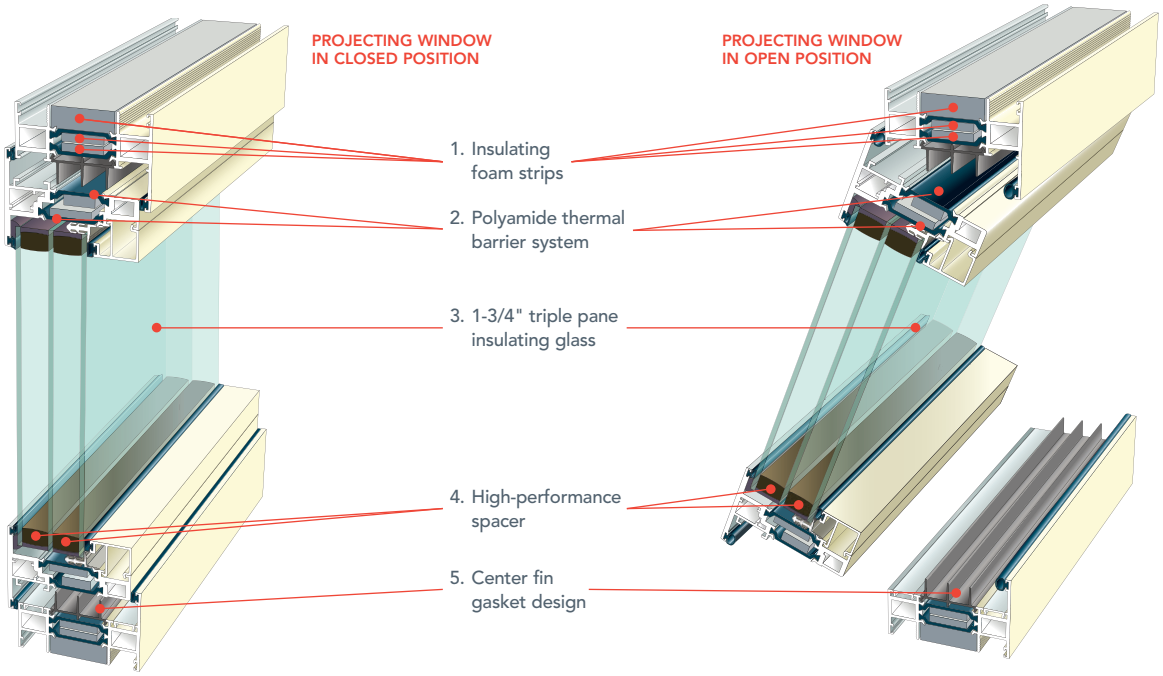
Using commercially available triple insulating glass, AA™4325 series windows have the potential to achieve U-factors of 0.17 for fixed and 0.22 for operable while still achieving a structural design pressure of 80 psf. Superior thermal efficiency also makes the window ideal for buildings seeking Leadership in Energy and Environmental Design (LEED®*) certification.

Aesthetics and Flexibility

When it comes to aesthetics, the AA™4325 series is the perfect combination of brains and beauty. The 3-1/4" frame depth delivers high thermal performance while its minimal sightlines offer superior aesthetics. A dual color option provides the flexibility to vary interior and exterior finishes. This enables a reduction in overall system cost as a result of using a more cost-efficient interior finish or adding accent exterior finishes.

This versatile window is available in several configurations including, fixed, projecting and casement. Additionally, the AA™4325 series offers the flexibility to add or remove thermal options based on performance and cost requirements.

A variety of removable interior stops accommodate multiple infill thicknesses with no disassembly required for re-glazing. Additionally, the factory fabricated and glazed window has durable hardware, including white bronze cam handles and 4-bar hinges. Options for access panels with blinds and insect screens are also available.



Kawneer Company, Inc.
Technology Park / Atlanta
555 Guthridge Court
Norcross, GA 30092

kawneer.com
770 . 449 . 5555

KAWNEER
AN ARCONIC COMPANY

H (LOGIC 5.0) HOIST OPERATOR

SECTION 08 71 13

KEY FEATURES

STANDARD APPLICATION	Recommended for rolling steel doors/grilles and high or vertical-lift sectional overhead doors in standard duty-cycle commercial applications where a manual hoist is required
RATED DUTY CYCLE	Standard-duty: Up to 25 cycles/hour up to 90 cycles/day (using continuous-rated motor)
OPERATOR SPEED	8-9 Inches per second
LIMIT SETTINGS	Mechanical
EMERGENCY DISCONNECT FOR MANUAL OPERATION	Floor-level emergency release sash chain
EMERGENCY DISCONNECT WITH AUTO-RECONNECT	Reconnects when tension is removed from emergency release sash chain
PROGRAMMING	Control function selector dial/tactile buttons
CIRCUIT BOARD	Solid-state Logic 5.0 circuit board
TIMER-TO-CLOSE	Programmable in 1 second and 15 second increments up to 68 minutes, standard
CLUTCH	Standard adjustable friction clutch
MID-STOP	Programmable
RUN TIME PROTECTION	Maximum run timer
MOTOR REVERSE ACTION PROTECTION	Delay-on-reverse circuit
MOTOR OPERATOR WALL CONTROL	3-Button Control Station with Maintenance Alert System (MAS)
PUSH BUTTON STATION	3-Push button Station (Open/Close/Stop)

SPECIFICATIONS

RADIO RECEIVER	Security+ 2.0® technology standard on-board with tri-band frequency; accepts up to (90) single-button or (30) 3-button remote controls plus up to (30) wireless keypads or an unlimited number of DIP switch remotes
VOLTAGE CONNECTIONS	Single-phase: 115V/230V dual voltage; 3-phase: 208V/230V/460V dual voltage; 3-phase: 575V single voltage
CONTROL CIRCUIT	5VDC NEC class 2
DRIVE REDUCTION	Belt/chain & pully; first-stage heavy-duty 5L V-belt; second-third-fourth stages #48 chain; #50 output sprocket chain
BEARINGS/BUSHINGS	Industrial ball bearings on a 1” output shaft; heavy-duty oil-filled bushings on reduction shafts
BRAKE	Standard on 3/4 and 1 HP operators; optional on 1/2 HP; not available on 1/3 HP
CONSTRUCTION	NEMA 1 type electrical box; heavy-duty 11-gauge steel frame with durable powder coat finish; all reduction sprockets drilled and pinned to shafts
WARRANTY	2 years

INSTALLATION FEATURES

MAXIMUM DOOR HEIGHT	26 feet standard with additional capability*
MAXIMUM DOOR WIDTH	22 feet standard with additional capability*
MAXIMUM ALLOWABLE SQUARE FOOTAGE	640 square feet
INTERNET CONNECTIVITY	myQ® Technology enables remote monitoring and control of the commercial door via a smartphone, tablet, or computer**

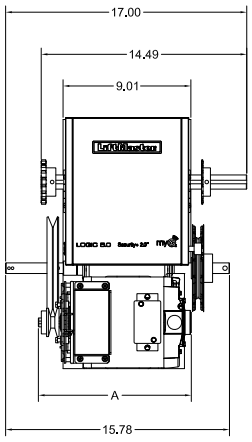
This commercial door operator must feature constant pressure to close or be equipped with an external monitored entrapment protection device. Use only LiftMaster monitored entrapment protection devices itemized on the accessory page of the operators installation manual to meet UL 325 requirements.

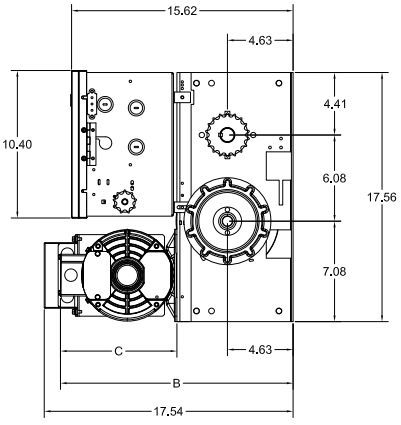
* Contact us at Specs@LiftMaster.com for additional capabilities.
**LiftMaster Internet Gateway and myQ app required.

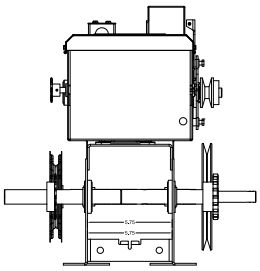
H (LOGIC 5.0) HOIST OPERATOR

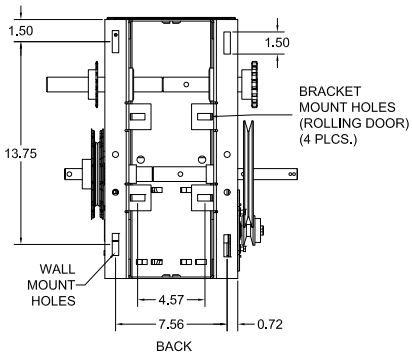
SECTION 08 71 13

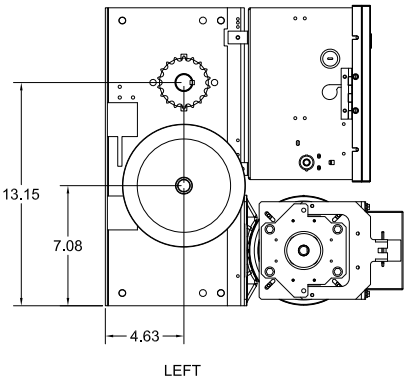
DIMENSIONS






TOP





CAPACITY

MAXIMUM DOOR AREA (SQ. FT.)							
ROLLING		24 ga. Steel	22 ga. Steel	—	20 ga. 18 ga. Steel	16 ga. Steel	—
		Aluminum Grilles	Aluminum Doors	—	Steel Grilles	—	—
SECTIONAL		—	24 ga. 22 ga. Steel	20 ga. Steel	—	16 ga. Steel	—
		Fiberglass	Aluminum Doors	Wood Doors	—	—	—
		—	—	24 ga. Steel Insulated	—	20 ga. Steel Insulated	16 ga. Steel Insulated
HP	1/3	310	285	260	210	175	125
	1/2	400	350	320	280	250	200
	3/4	560	500	450	380	325	250
	1	640	625	560	475	400	310

On steel insulated doors, a 24-gauge back panel is assumed.
If a heavier back panel is supplied, use the next higher HP rating.
Recommended max duty cycles: 25 per hour, up to 90/day.

LiftMaster.com
LMARENDSH 3/19

CLOPAY COMMERCIAL – MODEL 3717, 3718

energy series with intellicore®

Model 3717, 16'2" × 14' Doors; Shown with 24" × 8" Lites

CONSTRUCTION	EFFICIENCY	WARRANTY
1¾" THICKNESS	16.2 R-VALUE	10YR LIMITED CONSTRUCTION

POLYURETHANE INSULATED STEEL DOORS

Clopay Models 3717 and 3718 are for commercial and industrial facilities where temperature control, energy efficiency and durability considerations are all important.

- Intellicore® polyurethane insulation and thermal break for improved energy efficiency.
- Three-layer steel plus steel insulation enhances durability, strength and quiet operation.
- 3-stage paint process delivers a virtually maintenance-free finish.
- Injection-molded lite frames with integral weatherseal are durable and seal against the elements. Many glass options available for visibility, privacy or energy efficiency.

Panels are prepainted inside and out to inhibit rust. Hot-dipped, galvanized steel is painted with primer and given a tough oven-baked polyester top coat to provide the most rust-resistant steel door available. Ten-year warranty against rust-through.

clopaycommercial.com

PANEL DESIGNS

Minor Ribbed (3717)

Flush (3718)

COLOR OPTIONS

Standard White | Glacier White | Commercial Tan | Chocolate | Mocha Brown

Charcoal | Gray | Trinar® White | Trinar® Beige

Due to the printing process, colors may vary.

CUSTOM PAINT OPTION

COLOR BLAST®

Color Blast® offers more than 1,500 Sherwin-Williams® color options to complement your building design. This durable two-part paint system has been thoroughly tested and is backed by a five-year warranty.

Due to solar reflective formulation to meet greater than a 38 LRV, some colors may not be available.

FEATURES

STANDARD HARDWARE

- TPE astragal in aluminum retainer
- Commercial 10-ball steel rollers (nylon tires available)
- Steel step plate and lift handle
- Galvanized steel end stiles
- Inside slide lock for increased security
- 2" (50.8 mm) or 3" (76.2 mm) track
- 10,000 cycle springs
- Galvanized aircraft cable with minimum 7:1 safety factor
- Variety of track configurations to meet building specifications

MATERIALS AND CONSTRUCTION

Panel Thickness	1-3/4" (44.45 mm)
Insulation	CFC and HCFC-free Intellicore® polyurethane
R-value	16.2*
Thermal Break	Continuous foam
Exterior Steel	27 gauge (.016" min.) (.41 mm)
Interior Steel	28 gauge (.015" min.) (.38 mm)
Exterior Surface	Stucco embossed, minor ribbed (3717) Stucco embossed, flush (3718)
Max Width	3717: 32'2" (9.8 m); 3718: 32'2" (9.8 m)
Max Height	3717: 26' (7.9 m); 3718: 24' (7.3 m)
Exterior Colors	Standard White, Glacier White, Commercial Tan, Chocolate, Mocha Brown, Charcoal, Gray, Trinar® White and Trinar® Beige. Also available in Color Blast®.
Interior Color	Standard White
Limited Warranties	10-year delamination 10-year rust-through 1-year material and workmanship

**Calculated door section R-value is in accordance with DASMA TDS-163.*

For special sizes, applications and options, consult Commercial Information Assistance (CIA) at 1-800-526-4301.

ADDITIONAL OPTIONS

WINDOW OPTIONS

24" × 8"

24" × 12"

Full-View

26" × 13"

Available with insulated, insulated tempered or tempered glass. Full-view section, prepainted Standard White or Chocolate; glazing options include DSB, tempered, plexiglass, insulated, insulated tempered and polycarbonate. 26" × 13" (66.04 cm × 33.02 cm) windows are available with Lexan® or plexiglass.

HEAVY-DUTY HARDWARE *(where not standard)*

Double-end hinge

3" Track

High performance hardware features 10 gauge end hinges, heavy-duty top bracket and 3" sealed roller with 5/8" stem.

MULLIONS

Carry-away, roll-away or swing-up mullions are available on select sizes.

BREAK-AWAY SECTION

Single section and double sections available on select sizes.

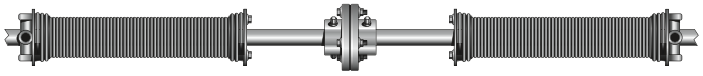
EXHAUST PORT

Can be cut into any type of sectional door. Available in select sizes.

WindCode® reinforcement available up to W1 design pressure (DP) 14 PSF, depending on size. Doors tested 50% greater than DP.

Upgrade your standard door with industrial-grade components.

HIGH CYCLE SPRINGS



25,000, 50,000 or 100,000 cycle springs available.

CODE COMPLIANT

This Clopay door complies with the 2015 IECC (International Energy Conservation Code) with an air infiltration rating of .40 cfm/ft² or less (IECC, Section 402.5.2), and also meets the U-factor requirement of .37 or less (IECC, Section C402.4, for Climate Zones 1 through 8).

Clopay®

For more information on these and other Clopay products, call **1-800-526-4301** or visit **clopaycommercial.com**

MADE IN USA

STEEL | ARCAT | DASMA | IDA www.doors.org

Roof System Profiles

200 Series - CL 508/Channelwall, CL 7015/815 and 1/2" Corrugated
500 Series - SuperVic, Diamond Rib
700 Series - VicElite, 7/8" Corrugated
1100 Series - CL 7040/840, CL 6025/725, CL 5022/622
CL 3035/435 and AD 150/200/275/300
1400 Series - CL 3070/470
1800 Series - CL 3100/400

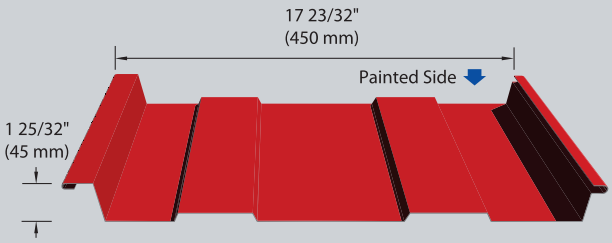
All flashings/trims are available 10'-0" long.

Custom flashings to specific requirements are available upon request.

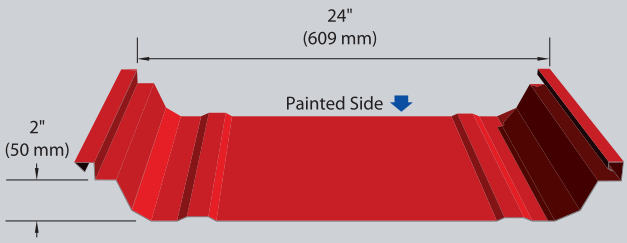
Please consult your Vicwest representative.

▲ Exposed side prepainted
(Dim.) = mm

MARQUIS
Manufactured in Oakville, ON

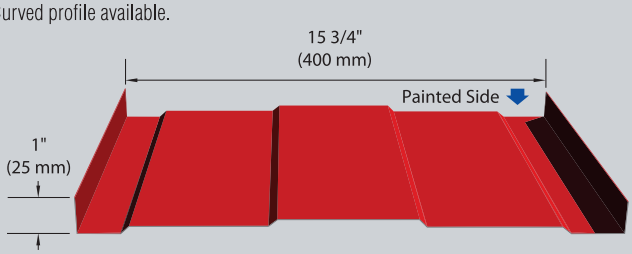


TSR
Manufactured in Oakville, ON and Edmonton, AB



TRADITION 100-4
Manufactured in Oakville, ON

Curved profile available.



TRADITION 150-4
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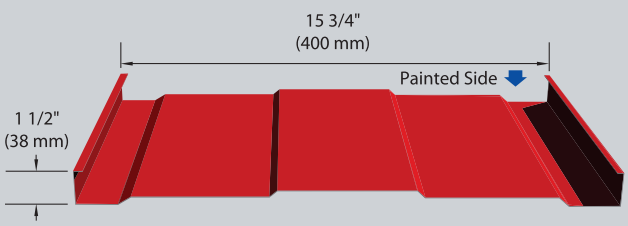
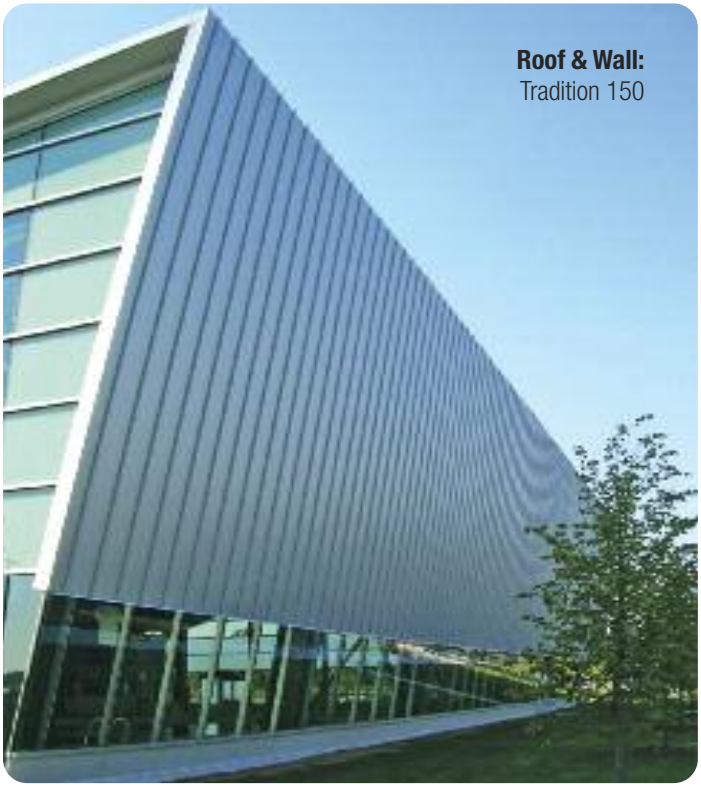
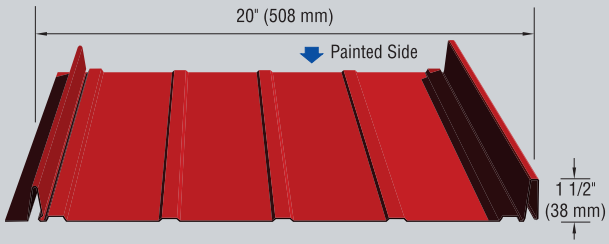


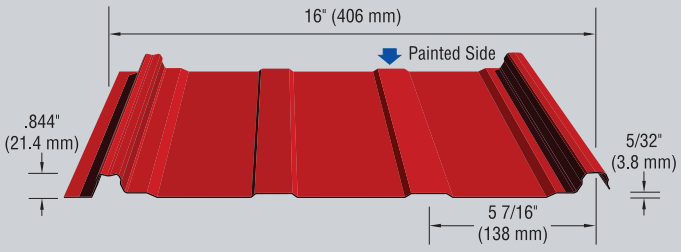


PRESTIGE
Manufactured in Delta, BC and Victoriaville, PQ

Also available in 16" coverage



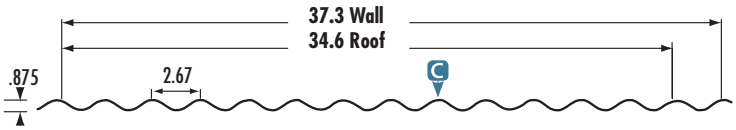
VICELITE
Manufactured in Stratford, ON



WF-7/8" CORRUGATED

Uniformly Distributed Loads (pounds/square foot) for 3 span condition

GA	PURLIN SPACING	3'	3'6"	4'	4'6"	5'
26	LBS. PER SQ FT	101	74	57	45	36



26 GAUGE STOCK COLORS

Galvanized	Bone White	Stone Grey	Black Coffee	Buckskin
Galvalume	Brite Red	Regent Grey	Metro Brown	Melchers Green
White White	Dark Red	Charcoal Grey	Dark Brown	Slate Blue
Brite White	Tile Red	Black	Tan	Heron Blue

26 GAUGE GALVALUME/GALVANIZED ..... SEE NET PRICING PAGE
26 GAUGE COLORED ..... SEE NET PRICING PAGE

24 GAUGE STOCK COLORS

Galvanized	Polar White	Brite Red	Regent Grey	Metro Brown	Heron Blue
Galvalume	Cambridge White	Dark Red	Charcoal Grey	Tan	International Orange
White White	Bone White	Tile Red	Black	Melchers Green	Gold
Brite White	Antique Linen	Stone Grey	Black Coffee	Slate Blue	

24 GAUGE GALVALUME/GALVANIZED ..... SEE NET PRICING PAGE
24 GAUGE COLORED ..... SEE NET PRICING PAGE

OTHER COLORS AND GAUGES AVAILABLE UPON REQUEST

ACCESSORIES

FIBREGLASS PANELS 8 OZ CLEAR 12'
NOVA SEAL II ROOF UNDERLAYMENT 10 SQ
LARGE TAB CLOSURE 36"
VENTED CLOSURE 25' ROLL
CUTTING CHARGE PCS UNDER 3'

TERMS Net 30 Days. Prices subject to change without notice.

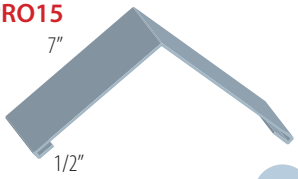
CSSBI
Canadian Sheet Steel Building Institute

Chilliwack, BC (604-858-7134)
Blackfalds, AB (403-885-3752)

RECOMMENDED FLASHINGS

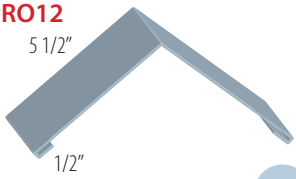
Flashings will be 4/12 pitch unless otherwise specified

RIDGE
PRO15



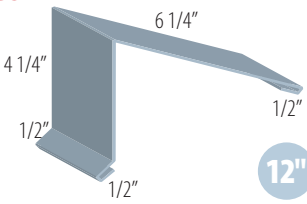
15"

HIP
PRO12



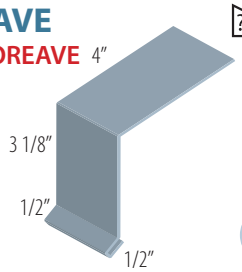
12"

PEAK
CORPEAK



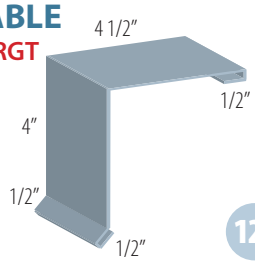
12"

EAVE
COREAVE



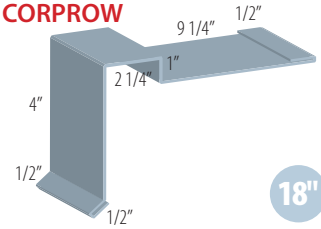
9"

GABLE
CORGT



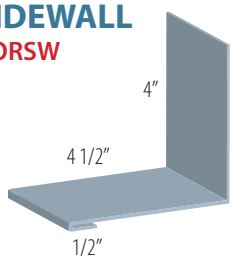
12"

PROW
CORPROW



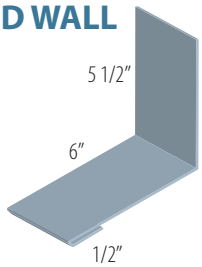
18"

SIDEWALL
CORSW



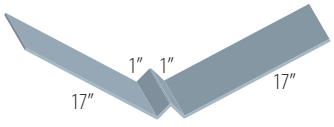
9"

END WALL
EW



12"

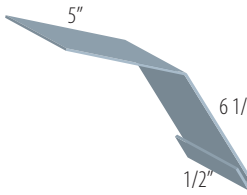
VALLEY
WV36



Specify if hems are needed

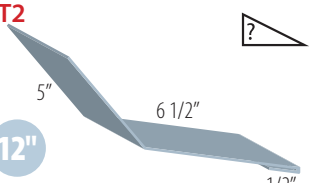
36"

ROOF TRANSITION
RT1



12"

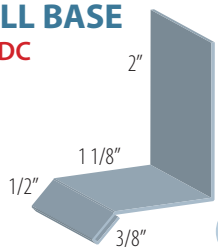
ROOF TRANSITION
RT2



12"

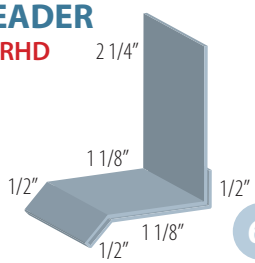
Low slope transitions may need larger dimensions

WALL BASE
CORDC



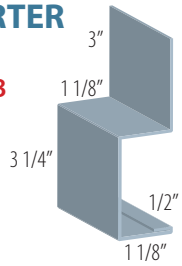
4"

HEADER
CORHD



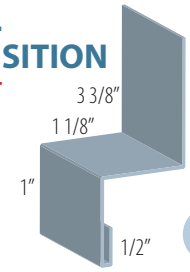
6"

STARTER BOX
CORSB



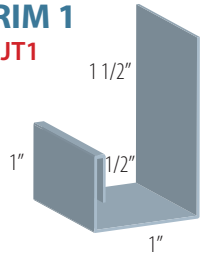
9"

WALL TRANSITION
CORWT



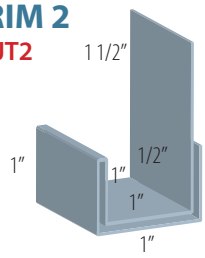
6"

J TRIM 1
CORJT1



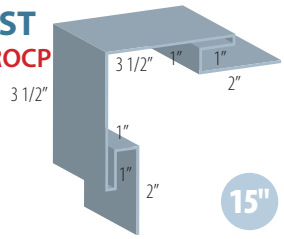
4"

J TRIM 2
CORJT2



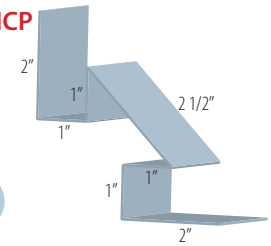
6"

OUTSIDE CORNER POST
COROCP



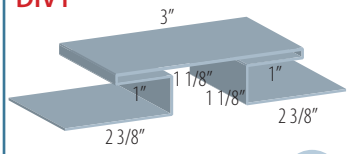
15"

INSIDE CORNER POST
CORICP



12"

DIVIDGER
DIV1



12"

Width	Galva/lume 29 Gauge	Color 29 Gauge	Galva/lume 26 Gauge	Color 26 Gauge	Kynar 26 Gauge	Aluminum 24 Gauge
4"						
6"						
9"						
12"						
15"						
18"						
24"						
30"						
36"						

Please see your local Westform dealer for pricing

TERMS Net 30 Days. Prices subject to change without notice.

Systèmes Norbec Inc.
97 De Vaudreuil
Boucherville QC J4B 1K7
Canada
Phone 450-449-1499
Fax : 450-641-4657

NORBEC™
Systèmes Norbec Inc.

Proposal #	Rev.
244045	0

Proposal made to

Refrigerative Supply Ltd (Burnaby)
8028 N Fraser Way
Burnaby BC V5J 3J8

Contact :
Phone: 604-435-1313
Fax : 604-435-7677
Cell :
Email :

Proposal information

Proposal Date : 2019-07-04
Valid Until : 2019-09-02
Project manager : Gianni Marone - gmarone@norbec.com
Sales Person : Ken W. Thomson
Estimator : Ionut Strat - istrat@NORBEC.COM
Terms : Net 30 jrs / days

Project **Cooler +freezer**

Comments :

-Installation not included
-Refrigeration not included

-Due to the recent issues with the BC building code should a municipality deem the panels part of the building envelope, in lieu of a piece of equipment, Norbec will not responsible for any cost incurred. We will assist in the process to get approval but these costs could be from $1500 and up depending upon how many boxes are required for approval. This problem will be rectified once the Province implements the new national code NBC2015.
-Norbec will supply seismic anchoring hardware for all boxes installed in British Columbia. However it will be your responsibility if required by your customer to have a plan stamped by a BC engineer. If boxes require ceiling suspension, Norbec will supply standard ceiling suspension as we cannot supply seismic suspension. It will be customer responsibility to have these approved

Line	Grp	Quantity	Description	Part Number	Total
1	10	**1,00 un/ea**	**Cold room**	0901-00001	

Rectangular room Freezer - - with ceiling - with floor.
dimensions: 13'4" x 9'10" height: 8'0"

Walls (4) : 3" thick, fire rated
- *Interior finish : Prepainted white QC-5216 26ga galvanized steel Silkline*
- *Exterior finish : Prepainted white QC-5216 26ga galvanized steel Silkline*

Ceiling : 3" thick, fire rated
- *Interior finish : Prepainted white QC-5216 26ga galvanized steel Silkline*
- *Exterior finish : Prepainted white QC-5216 26ga galvanized steel Silkline*

Floor : 3" thick, fire rated
- *Interior finish : Galvanized steel 18ga*
- *Exterior finish : Prepainted white QC-5216 26ga galvanized steel Silkline*
- *Floor spacers : 1" in Galvanized steel 16ga*

Options:
- *Sealant : Silicone*
- *Junction : Norbec - Corners : Standard*
- *Floor junction : Male joint*

Accessories:
- *2 Vapor proof light fixture, c/w Globe,Wire protector*

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Boucherville QC J4B 1K7
Canada
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Fax : 450-641-4657

NORBEC™
Systèmes Norbec Inc.

Proposal #	Rev.
244045	0

2 10 **1,00 un/ea Door & frame assembly custom built** 0902-00001

Door :
Freezer type PL-1650 - door with heavy duty aluminium frame
Dimensions : 52" x 80" door of 3" with frame of 3"
Interior door finish : Prepainted white QC-5216 26ga galvanized steel Silkline
Exterior door finish : Prepainted white QC-5216 26ga galvanized steel Silkline

Hardware :
- *2 x K-1277 zinc offset hinges*
- *Handle K-78 brushed chrome*

, strike K-56 brushed chrome offset
- *Inside release K-481*
- *Compressible gasket*
- *Without sweep*

Options:
- *L-shaped 1/2" aluminium threshold heated*
- *1 Intelligence I3*
- *1 Heated vent 115v*

3 10 **1,00 un/ea Seismic anchoring kit (box with floor)** 0904-00010

Sub-total for this group :

4 20 **1,00 un/ea Cold room** 0901-00001

Rectangular room Cooler - - with ceiling - without floor.
dimensions: 13'4" x 9'10" height: 8'0"

Walls (4) : 3" thick, fire rated
- *Interior finish : Prepainted white QC-5216 26ga galvanized steel Silkline*
- *Exterior finish : Prepainted white QC-5216 26ga galvanized steel Silkline*

Ceiling : 3" thick, fire rated
- *Interior finish : Prepainted white QC-5216 26ga galvanized steel Silkline*
- *Exterior finish : Prepainted white QC-5216 26ga galvanized steel Silkline*

Options:
- *Sealant : Silicone*
- *Junction : Norbec - Corners : Standard*
- *Floor junction : Male joint*

Accessories:
- *2 Vapor proof light fixture, c/w Globe,Wire protector*

5 20 **1,00 un/ea Door & frame assembly custom built** 0902-00001

Door :
Cooler type PL-1650 - door with heavy duty aluminium frame
Dimensions : 52" x 80" door of 3" with frame of 3"
Interior door finish : Prepainted white QC-5216 26ga galvanized steel Silkline
Exterior door finish : Prepainted white QC-5216 26ga galvanized steel Silkline

Hardware :
- *2 x K-1277 zinc offset hinges*
- *Handle K-78 brushed chrome*

, strike K-56 brushed chrome offset
- *Inside release K-481*
- *Compressible gasket*
- *With sweep*

Options:
- *1 Intelligence I3*

Systèmes Norbec Inc.
97 De Vaudreuil
Boucherville QC J4B 1K7
Canada
Phone 450-449-1499
Fax : 450-641-4657

NORBEC™
Systèmes Norbec Inc.

Proposal #	Rev.
244045	0

6	20	**1,00 un/ea**	**Seismic anchoring kit (box without floor)**	0904-00009

Sub-total for this group :

7	30	**1,00 un/ea**	**Freight - Standard**	0701-00001

Delivery to Nanaimo, BC

Majority of carriers rates includes 30 minutes offloading time. Additional charges will be applicable beyond 30 minutes. The driver is not responsible for offloading merchandise. It is your responsibility to supply materiel and labour to unload truck.

Freight price is based on 53' trailer usage. If site cannot accommodate this type of transport, additional charges may be applicable.

IMPORTANT : Norbec cannot guarantee specific delivery time with ANY freight company. Norbec will schedule shipment to be as close as possible to requested delivery date. As freight is a third party involvement, Norbec cannot be held responsible for any delays on freight....

Sub-total for this group :

Grand Total

Canadian dollar, all taxes extra

FOB Our plant

Thank you for the opportunity to quote on your project, please feel free to communicate with us if you have any questions.

This quote reflects all information we had on hand at the time of quotation and only includes items listed above. Please verify all dimensions and options with your requirements.

Systèmes Norbec Inc.
97 De Vaudreuil
Boucherville QC J4B 1K7
Canada
Phone 450-449-1499
Fax : 450-641-4657

NORBEC™
Systèmes Norbec Inc.

Proposal #	Rev.
244045	0

Standard commercial terms (SNI):
1. Only Systèmes Norbec Inc. standard warranty is applicable to this offer (unless otherwise indicated). The warranty document is available on our web site.
2. This proposal is based on our understanding of the information provided to produce it. The client is responsible to verify the accuracy of the content.
3. Prices are valid for 60 days base on a delivery taking place 120 days after the proposal date unless otherwise indicated.
4. Delivery lead time provided is an estimate. It must not be interpreted as a delivery commitment.
5. All customers are subject to a credit evaluation. An advance deposit of 50% minimum and balance due prior to shipment could be required.
6. Terms of payment: Net 30 days, unless otherwise noted.
7. An interest rate of 1.0% per month is applicable on all past due balance.
8. All applicable taxes will be added to prices indicated on the proposal.
9. Systèmes Norbec Inc. shall not be held responsible for any cost to customer resulting in a delay in delivering the product such as:
- Labor and equipment rental, direct or indirect damages or any consequential damages such as, but not limited to, loss of revenue, loss of sales, loss of goods of any nature whatsoever.
- Conditions out of our control such as but not exclusively limited to an act of god, force majeure, strike, shortages of raw materials from suppliers or superior force such as an earthquake, tornado, etc.
10. In any circumstances, Systèmes Norbec Inc. responsibilities will be limited to the value of goods purchased.
11. Systèmes Norbec Inc. reserves the right to correct any error or omission in this proposal.
12. The customer must take delivery of his material on the agreed upon delivery date. Systèmes Norbec Inc. reserves the right to charge a warehousing fee for any order left on our property in excess of 7 calendar days after the schedule delivery date. The customer will become responsible for any damages resulting from the storage.
13. The customer is responsible for receiving, inspecting for damages, handling and storing the material on site. These operations must be performed in accordance with our directives supplied with the shipment and title: Receiving, storage, inspection and handling guide for panels.
14. When quantities ordered are different than quantities quoted for Norex or Noroc panels, a price adjustment based on lot sizes would be apply. Set-up fees will be charge for lot sizes below 4000 ft².

The following conditions are not the responsibility of Systems Norbec Inc. unless noted otherwise within this proposal:
The area where the cold room is to be installed must be clean, dry and free of any obstacles before installation. Panels have been designed to be installed on a level floor surface.
All penetrations (floors, ceilings, walls) required for other trades and sealing of said holes.
Roof sleepers for outdoor condensing units.
All electrical connections must be made by a licensed electrical contractor in accordance with all governing codes.
Refrigeration Systems capacity are based on ambient temperature of 90°F; customer to ensure adequate ventilation to prevent overheating.
Applies only to Refrigeration Systems sold as parts only without installation:
Not included: piping, insulation, refrigerant, evaporator drain line.
Installation to be done by a qualified refrigeration company in accordance with all governing codes.
Refrigeration System warranty does not cover loss of product due to malfunction or failure of the system.
For a water cooled refrigeration unit, customer must install all plumbing necessary to supply systems with the required quantity clean cool water.
Water flow must be sufficient to allow temperature control at the water outlet by adjusting the water valve.
Water inlet must be a maximum of 24C/75F with an outlet of 35C/95F
Warranty 1 year parts only.
Applies only to water-cooled Refrigeration Systems sold as parts only - without installation:
The customer must install all plumbing necessary to supply systems with the required quantity clean cool water.
Water flow must be sufficient to allow temperature control at the water outlet by adjusting the water valve.
Water outlet must be a maximum of 35C/95F to minimize scaling.
For Penthouse type (PRO3) Refrigeration Systems:
Warranty 1 year parts only. This system must be started up by a certified refrigeration technician. No warranty will be applied without proof of a startup made by a certified refrigeration technician

Grand Total _____

Canadian dollar, all taxes extra

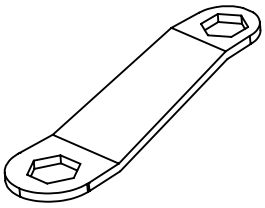
FOB **Our plant**

_____ _____ _____

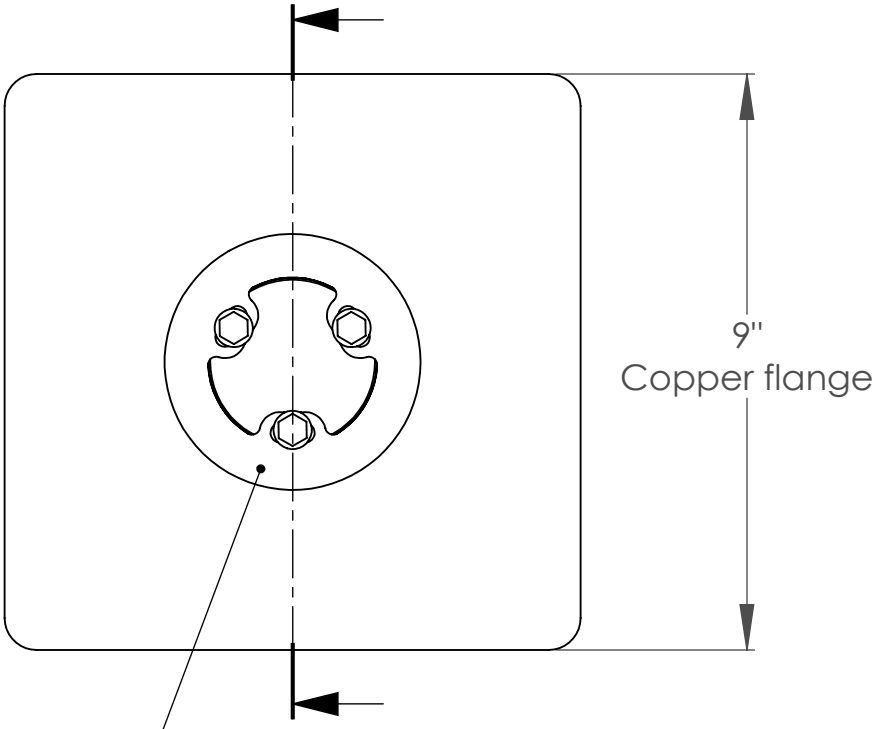
ACCEPTED BY DATE P.O. #

3" Clamp-Tite Overflow Drain Copper

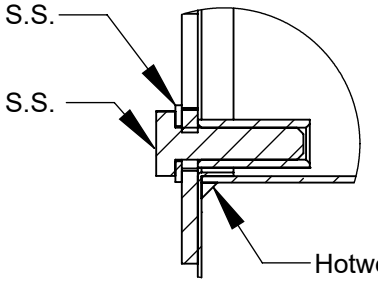
Part #	Size	Weight
300-3170	3"	2.10 lbs

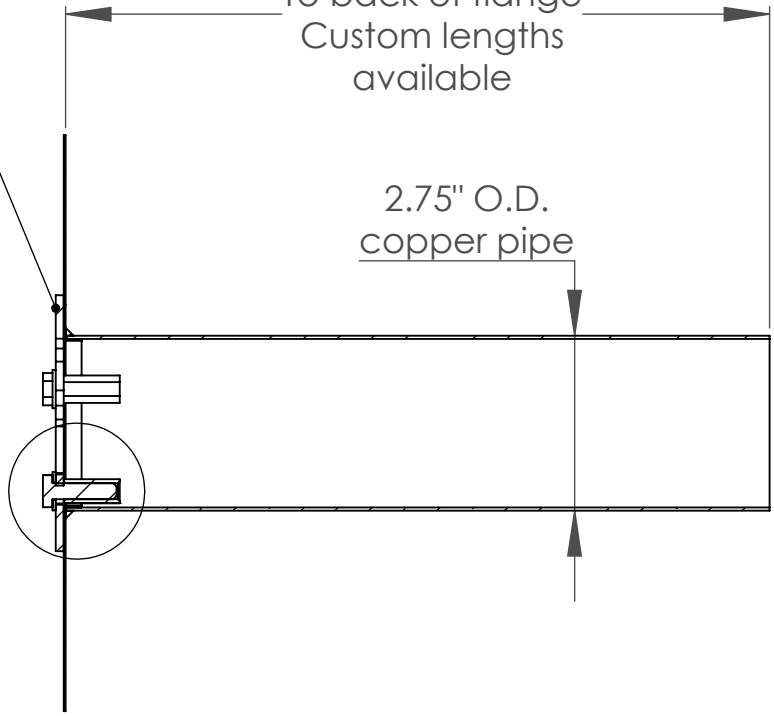


Assembly wrench included



0.125" thick aluminum retainer





Features

- Hotweld assembly
- All fasteners are S.S.
- Custom pipe lengths available
- Available in TPO Direct Weld
- Longer pipes available

Innovative Ideas Since 1978

DATE: 06/27/17

DRAWN BY: ZV

COMMENTS:

DO NOT SCALE DRAWING

Part title & J#

3" Clamp-Tite Overflow Drain Copper

SIZE **A**

19370 - 60th Ave., Surrey, BC V3S 3M2
Ph: 604-530-0712
Fax: 604-530-8482
www.menzies-metal.com

HEDLEY™ SHOWERS

Model S601

GELCOAT

Model S601

Model S601

Length: 60" (1524 mm)
Width: 36" (914 mm)
Height: 76 5/8" (1946 mm)

Shipping Weight: 120 lbs. (54.5 Kg)

Materials: Gelcoat finish reinforced with fibreglass.

A seatless 5' shower unit, the Hedley allows the use of a user-provided removable shower seat (not included). A lower curb provides ease of access, while allowing normal floor drain installation.

Standard Features:
- Easy to clean high gloss surface
- Chip and mar resistant
- Moulded-in floor pattern
- Two convenient toiletry shelves
- Pillars for added strength

Colours:
- Standard: White, Almond (Bone) or Biscuit
- Optional: Kohler Colours

Other Configurations:
- 2-piece knockdown (KD)

All products manufactured by Hytec are covered by a comprehensive five-year limited warranty from the date of sale to the original owner. See the Hytec Bathing Fixtures List Price Book for further details.

Hytec Plumbing Products
(Division of Kohler Canada Co.)
4150 Spallumcheen Dr, Armstrong BC V0E 1B6
Ph. (800) 871-8311 (250) 546-3196 Fax (250) 546-3170

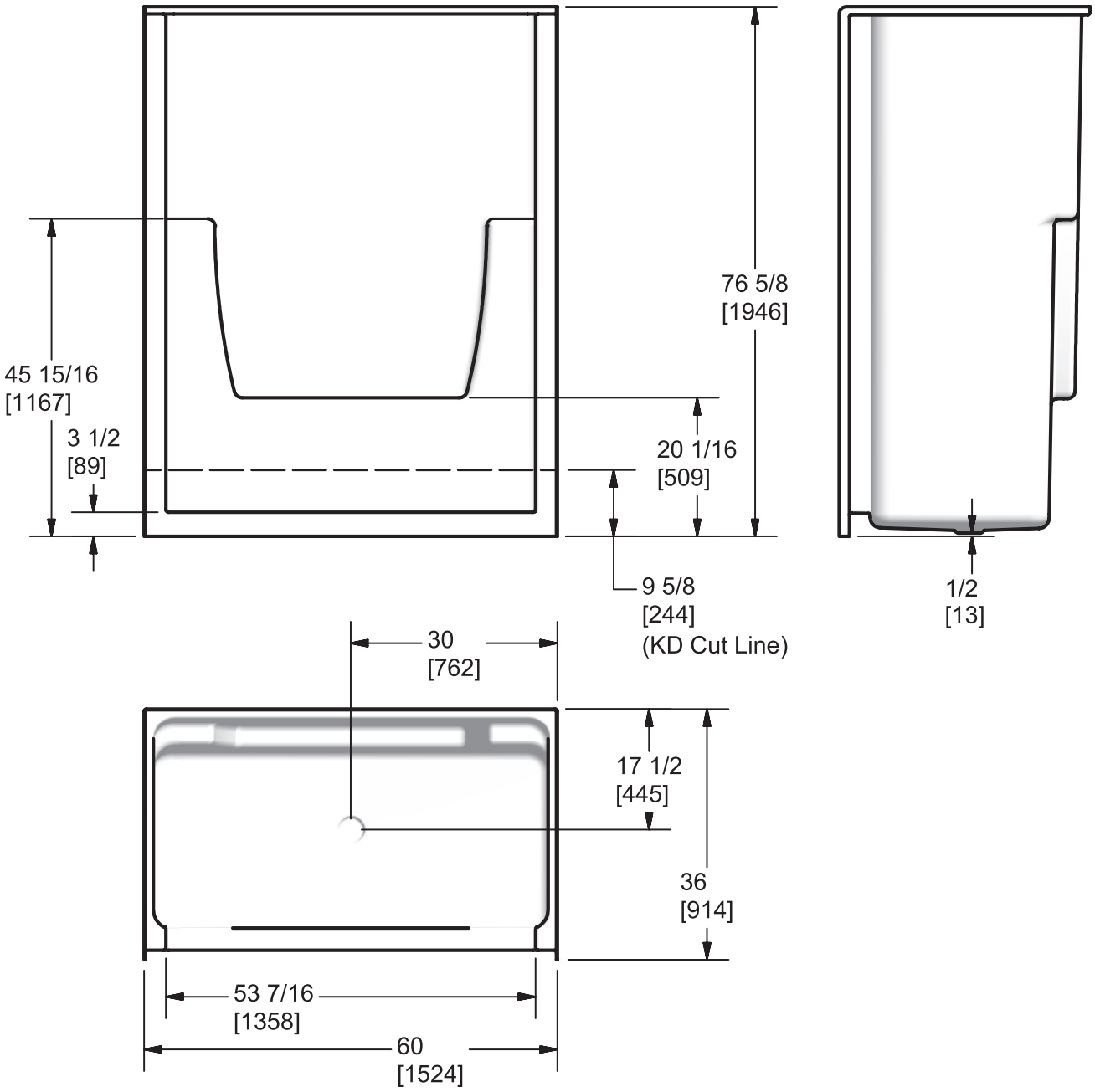
HYTEC
A KOHLER COMPANY

HEDLEY™ SHOWERS

Hytec.ca

Model S601

GELCOAT



Measurement tolerances ± 1/4" (6.3 mm)

All bathing fixtures comply with the applicable Canadian Standards.

For installation procedures, please refer to instructions included with each unit.

This sheet approximately describes products and equipment manufactured or supplied by Hytec Plumbing Products. Because of ongoing efforts to improve both design and quality, products and equipment actually furnished may differ without prior notice.

Hytec Plumbing Products
(Division of Kohler Canada Co.)
4150 Spallumcheen Dr, Armstrong BC V0E 1B6
Ph. (800) 871-8311 (250) 546-3196 Fax (250) 546-3170

HYTEC
A KOHLER COMPANY

LEDWARD II™ SHOWERS

Model 4160/61

GELCOAT

Model 4161

Model 4160
(Right-hand Plumbing, Left-hand Seat)

Model 4161
(Left-hand Plumbing, Right-hand Seat)

Width: 48" (1219 mm)
Depth: 31 1/4" 794 mm)
Height: 78 1/4" (1988 mm)

Shipping Weight: 128 lbs. (58 Kg)

Materials: Gelcoat finish reinforced with fibreglass.

A large comfortable shower with soap ledges at various heights, convenient foot rests and the option of right hand or left hand seat.

Standard Features:
- Integral seat
- Easy to clean high gloss surface
- Chip and mar resistant
- Moulded-in floor pattern
- Two convenient toiletry shelves
- Pillars for added strength
- Built-in foot rest

Colours:
- Standard: White, Almond (Bone) or Biscuit
- Optional: Kohler Colours

Other Configurations:
- 2-piece knockdown (KD)

All products manufactured by Hytec are covered by a comprehensive five-year limited warranty from the date of sale to the original owner. See the Hytec Bathing Fixtures List Price Book for further details.

Hytec Plumbing Products
(Division of Kohler Canada Co.)
4150 Spallumcheen Dr, Armstrong BC V0E 1B6
Ph. (800) 871-8311 (250) 546-3196 Fax (250) 546-3170

HYTEC
A KOHLER COMPANY

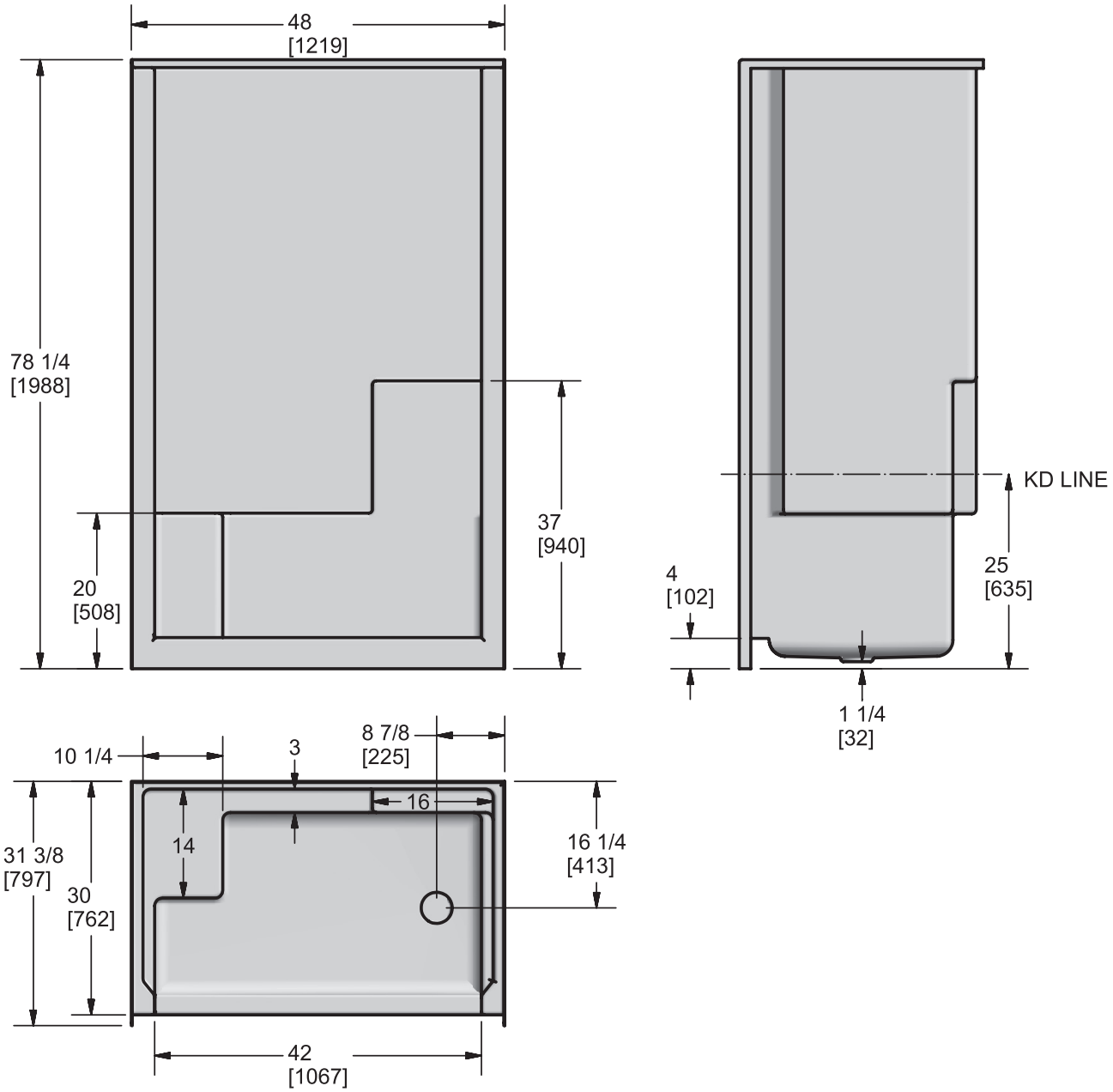
S&R

LEDWARD II™ SHOWERS

Hytec.ca

Model 4160/61

GELCOAT



Measurement tolerances ± 1/4" (6.3 mm)

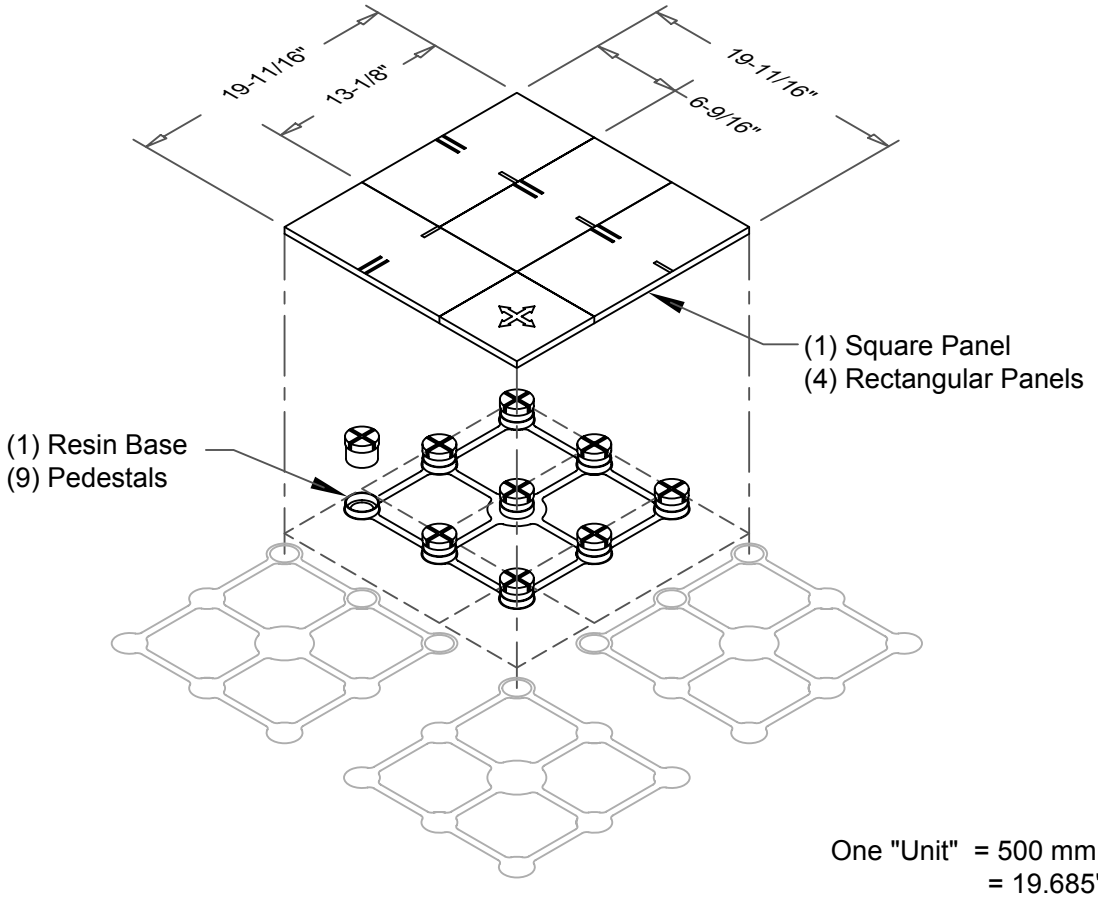
All bathing fixtures comply with the applicable Canadian Standards.

For installation procedures, please refer to instructions included with each unit.

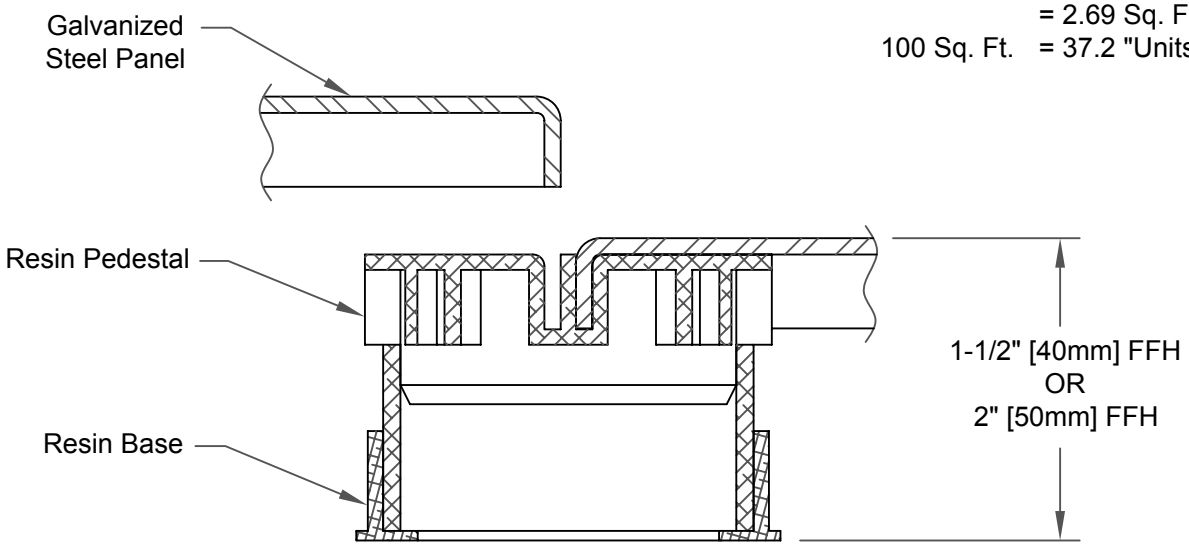
This sheet approximately describes products and equipment manufactured or supplied by Hytec Plumbing Products. Because of ongoing efforts to improve both design and quality, products and equipment actually furnished may differ without prior notice.

Hytec Plumbing Products
(Division of Kohler Canada Co.)
4150 Spallumcheen Dr, Armstrong BC V0E 1B6
Ph. (800) 871-8311 (250) 546-3196 Fax (250) 546-3170

HYTEC
A KOHLER COMPANY



One "Unit" = 500 mm Sq.
= 19.685" Sq.
= 2.69 Sq. Ft.
100 Sq. Ft. = 37.2 "Units"



NOTE: Cut-Sheet drawing and specifications are subject to change without prior notice.

ASM Modular System Inc.®
9500 Industrial Center Dr.
Ladson, SC, 29456
Tel: 843-534-1110
Fax: 843-534-1111
www.asmproducts.com

STARNET
SLP-40 / SLP-50
LOW-PROFILE
FLOOR SYSTEM

KONE EcoSpace™

Configurations and Dimensions

Max Travel
48' (14.6 m)

Max Landings
4

Speed
150 fpm
(.75 m/s)

Car Height F
8 or 10 ft.
(2438 or 3048 mm)

Entrance Height G
7, 8 or 9 ft.
(2134, 2438 or
2743 mm)

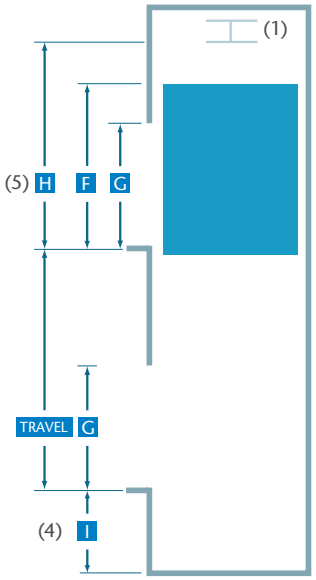
		CAPACITY LBS. (kg)	OPENING TYPE	A HOISTWAY WIDTH (mm)	A SEISMIC HOISTWAY WIDTH (mm)	B HOISTWAY DEPTH (mm)	C INTERIOR WIDTH (mm)	D INTERIOR DEPTH (mm)	E DOOR WIDTH (mm)
Front Opening	PASSENGER	2000 (907)	SSP	7'-4" (2235)	7'-8" (2337)	5'-9" (1753)	5'-8" (1727)	4'-3" (1295)	3'-0" (914)
		2500 (1134)	SSP-CO	8'-4" (2540)	8'-8" (2642)	5'-9" (1753)	6'-8" (2032)	4'-3" (1295)	3'-6" (1067)
		3000 (1361)	SSP-CO	8'-6" (2591)	8'-8" (2642)	6'-3" (1905)	6'-8" (2032)	5'-0" (1524)	3'-6" (1067)
		3500 (1588)(7)	SSP-CO	8'-6" (2591)	8'-8" (2642)	6'-11" (2108)	6'-8" (2032)	5'-6 3/16" (1681)	3'-6" (1067)
Front & Reverse Opening	PASSENGER	2000 (907)	SSP	7'-4" (2235)	7'-8" (2337)	6'-3 1/4" (1911)	5'-8" (1727)	4'-3" (1295)	3'-0" (914)
		2500 (1134)	SSP-CO	8'-4" (2540)	8'-8" (2642)	6'-3 1/4" (1911)	6'-8" (2032)	4'-3" (1295)	3'-6" (1067)
		3000 (1361)	SSP-CO	8'-6" (2591)	8'-8" (2642)	6'-11" (2108)	6'-8" (2032)	5'-0" (1524)	3'-6" (1067)
		3500 (1588)(7)	SSP-CO	8'-6" (2591)	8'-8" (2642)	7'-5 1/4" (2267)	6'-8" (2032)	5'-6 3/16" (1681)	3'-6" (1067)

CLEAR OVERHEAD H AND PIT DEPTH I

CAPACITY LBS. (kg)	150 FPM (.75 m/s)	
	Pit Depth (mm)	Clear Overhead (mm)
2000 to 3500 (907 to 1588)	5'-0" (1524)	13'-0" (3962)

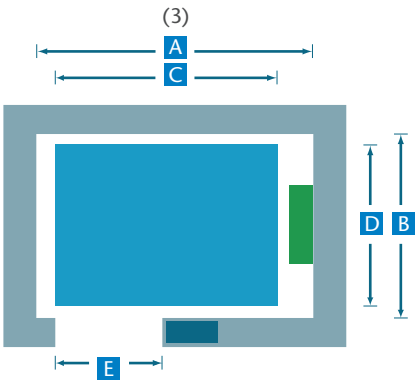
CONTROL SPACE		J	K	L
CAPACITY LBS. (kg)	CONTROLLER SPACE	WIDTH (mm)	DEPTH (mm)	DOOR WIDTH (mm)
2000 to 3500 (907 to 1588)	integral or remote closet	3'-8" (1118)	1'-8" (508)	3'-0" (914)
2000 to 3500 (907 to 1588)	adjacent room	5'-0" (1524)	dimension (B)	3'-0" (914)

Section View

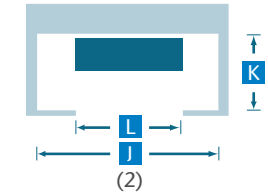


Visit kone.us for the latest project-specific details, CAD drawings, CSI specifications, electrical data, reaction loads and building access requirements.

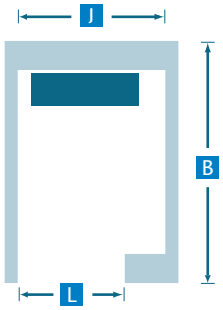
Plan Views



Integrated Control Solution 1.0 (standard)



Integral or Remote Control Closet (option 1)



Adjacent or Remote Control Room (option 2)

Notes

(1) A hoist beam (by KONE) is required for installation (by others). Dimension H reflects clear under hoist beam.

(2) If an EBD (Emergency Battery Device) is required please contact your KONE Sales Professional for further detail regarding dimensions J and I.

(3) The published hoistway A dimensions represent the minimum clear inside requirements. Construction efficiencies can be realized by increasing these dimensions by up to 2" (51 mm).

(4) For pit depths less than 5'-0" (1524 mm) please contact a KONE Sales Professional.

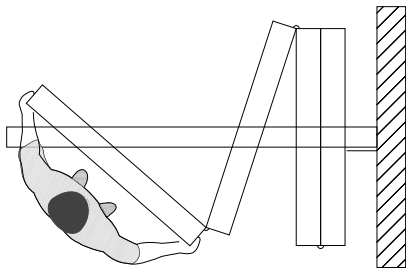
(5) All dimensions are based on an 8'-0" (2438 mm) cab with a 7'-0" (2134 mm) door. Alternate car and door heights are available, but will affect dimension H.

(6) Contact your local KONE Sales Representative regarding local code variations when utilizing the integrated, integral and remote closet options.

(7) Stretch accessibility based on International and California Building Code specified 24 inch by 84 inch stretcher — with 5 degree radius corners. Elevator car must utilize a slide side door.

SF3056
Rev 0719

Manually Operated, Continuously Hinged (Train) Panels



Top Supported
Center Stack
Continuously Hinged Panels
Manually Operated
Maximum Height: 12'3" [3.7m]
Maximum Opening Width: 40'5-1/2" [12.33m]
STC Ratings: 41, 43, 47, 49, 51

PRODUCT OVERVIEW:

Select for Value: Series 633 panels offer a wide choice of finish options, accessories, and sound control levels.

Standard Features: The panels have a steel frame, full height vertical edge protection, a selection of acoustic ratings, continuous contact top and bottom seals, and are a nominal 3-1/2" [89] thick.

Continuously Hinged (Train) Panels: Select for wall-to-wall space division. Panels are hinged together and are manually moved across the opening. Note that the operator will be pulling the weight of the partition when moving it in place; therefore, we recommend this model be used in smaller sized openings.

How to Obtain: Hufcor partitions are sold, installed, and serviced by factory-trained local authorized Distributors in the United States and by Licensees and Distributors outside the U.S.A.

Delivery: Panels are custom built for your specific project. Lead times vary due to seasonal fluctuations. Check with your Distributor for the current schedule.

Warranty: Track and panels are guaranteed for ***two years*** against defects in material and workmanship.

"Standard" Product Features and Benefits:

Look for these features when comparing similar products.

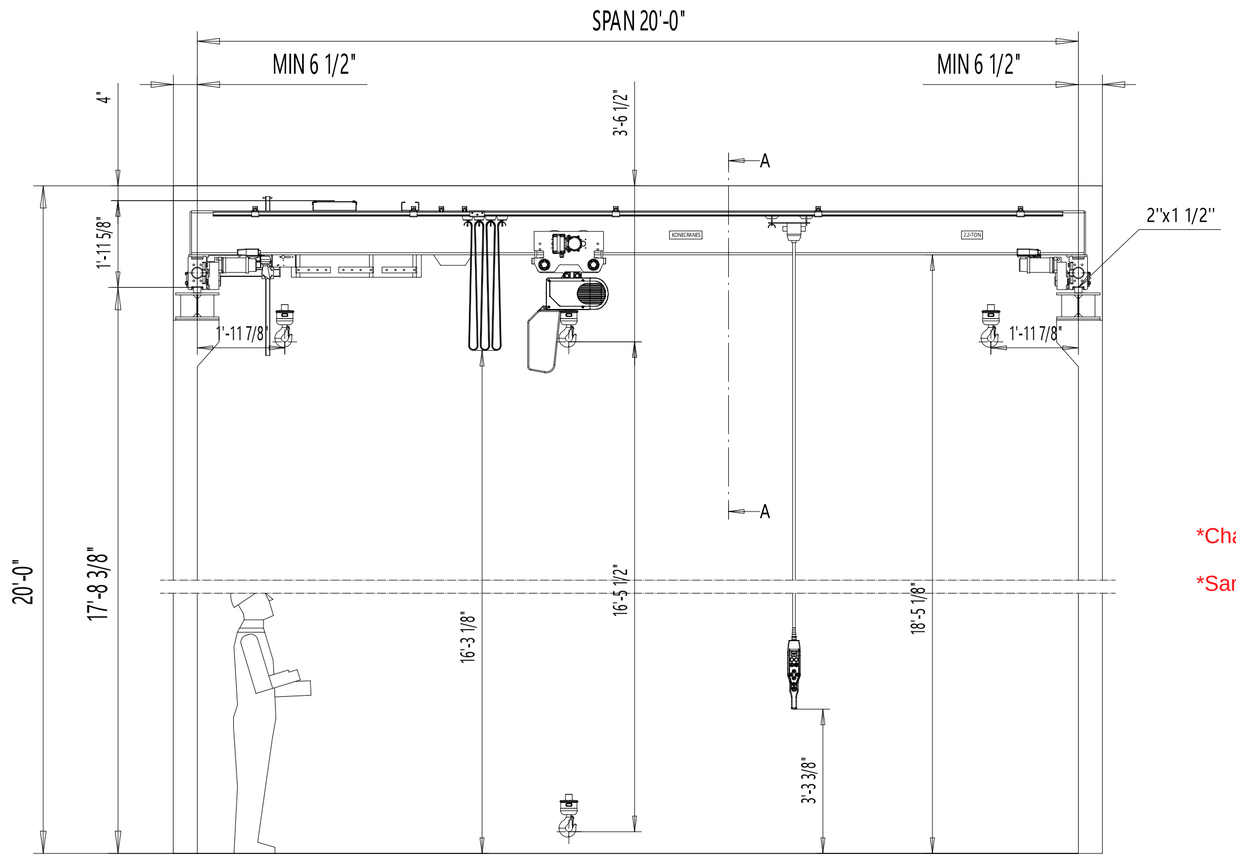
1. **Feature:** Protective trim
   Benefit: It protects the panel edges and faces.
2. **Feature:** Carrier on each panel
   Benefit: Holds the weight of each panel and ensures smooth even operation. No rub or guide rails required.
3. **Feature:** Low profile hinges
   Benefit: Safety and aesthetics - no unsightly hinges protruding from the panel faces.
4. **Feature**: Interlocking vertical seal
   Benefit: Prevents sound leaks between panels.

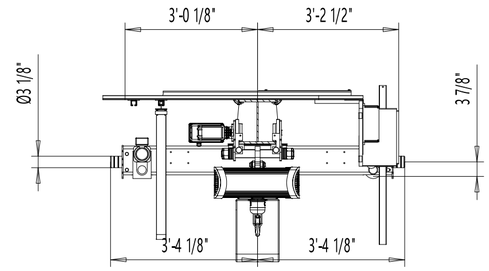
Optional track systems, seals, and accessories enable the standard product to be modified for optimum versatility. See details provided or ask your Hufcor representative for the features you want.

HUFCOR

Port Hardy OPP-O

REV	CHANGE DESCRIPTION	ECN	DATE	REVISED BY	APPROVED BY



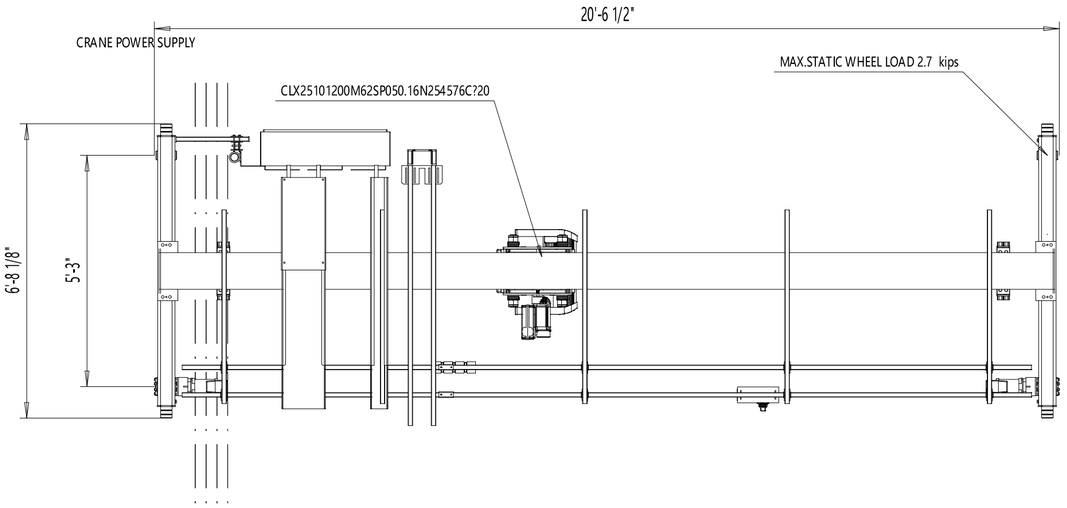


VIEW A-A

*Chain Hoist Option for Loading & dimensions.

*Same clarifications from wire rope option apply.

SPECIFY NORTH



TECHNICAL DATA

SPAN	: 20'-0"
LOAD	: 2.2-TON
LIFTING HEIGHT	: 16'-5 1/2"
HOISTING SPEED	: 30.0/5.2 ft/min 2-speed
TRAVERSING SPEED	: 65/17 ft/min 2-speed inverter
TRAVELLING SPEED	: 100 ft/min stepless
WEIGHT OF TROLLEY	: 476 lbs
WEIGHT OF BRIDGE	: 1832 lbs
CRANE CLASSIFICATION	: CMAA Class C
POWER SUPPLY	: 575 / 115 V; 60 Hz

SURFACE TREATMENT OF CRANE

BRIDGE COLOR	: RAL1028
PAINT	: ENA/127 µm

Access to crane and certain maintenance items is via man lift

Indoor Use crane

Radio controlled crane

Pendant as backup

ACCEPTED BY:

COMPANY:

DATE:

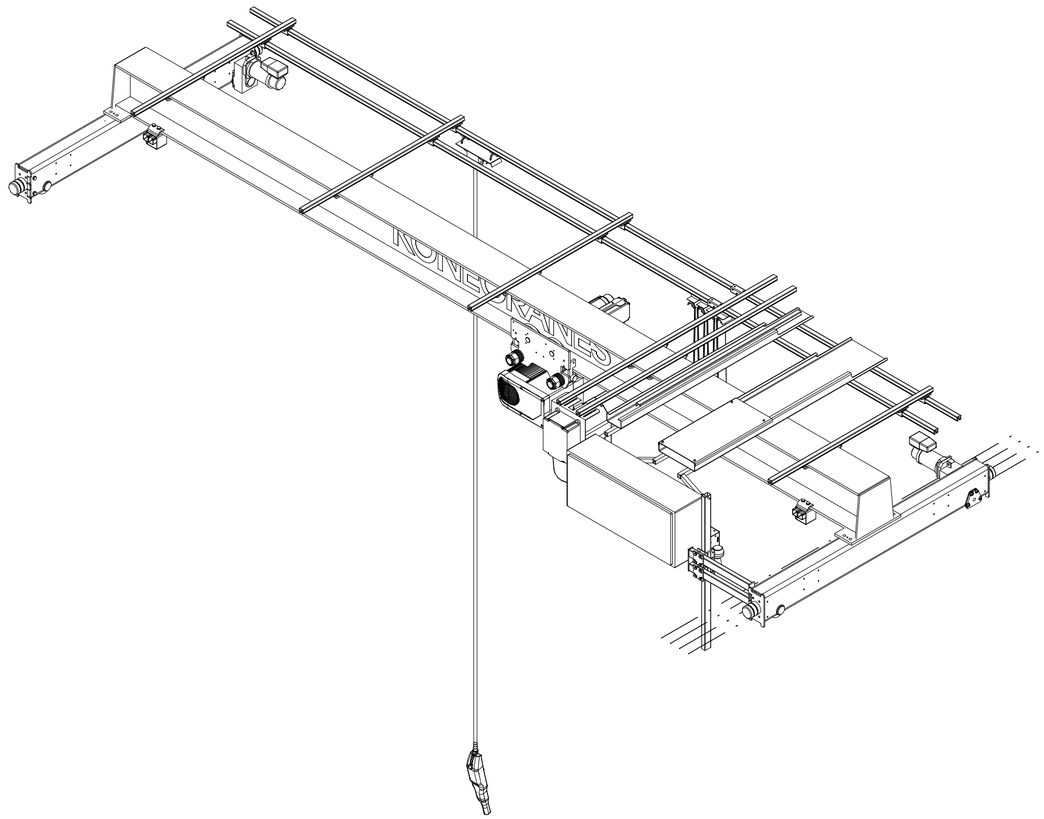
Pos	Amount	Description	Specification

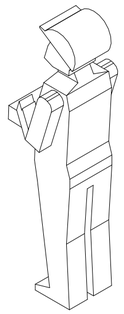
DKA/PCW Design	Chd	Appd	Ref drawing	DAS / 2.102.20 Vx proj
06/12 Date	CLXSks2.2-TON x 20ft Hol:16.46ft			1:30
(Calgary PCW) Dept	Port Hardy OPP			M-film
KONECRANES KONECRANES CANADA INC.	2 tonne TRSG, Span 20'-0'', Hol 17'-0''			
	Port Hardy OPP-O			Issue

Twin copy

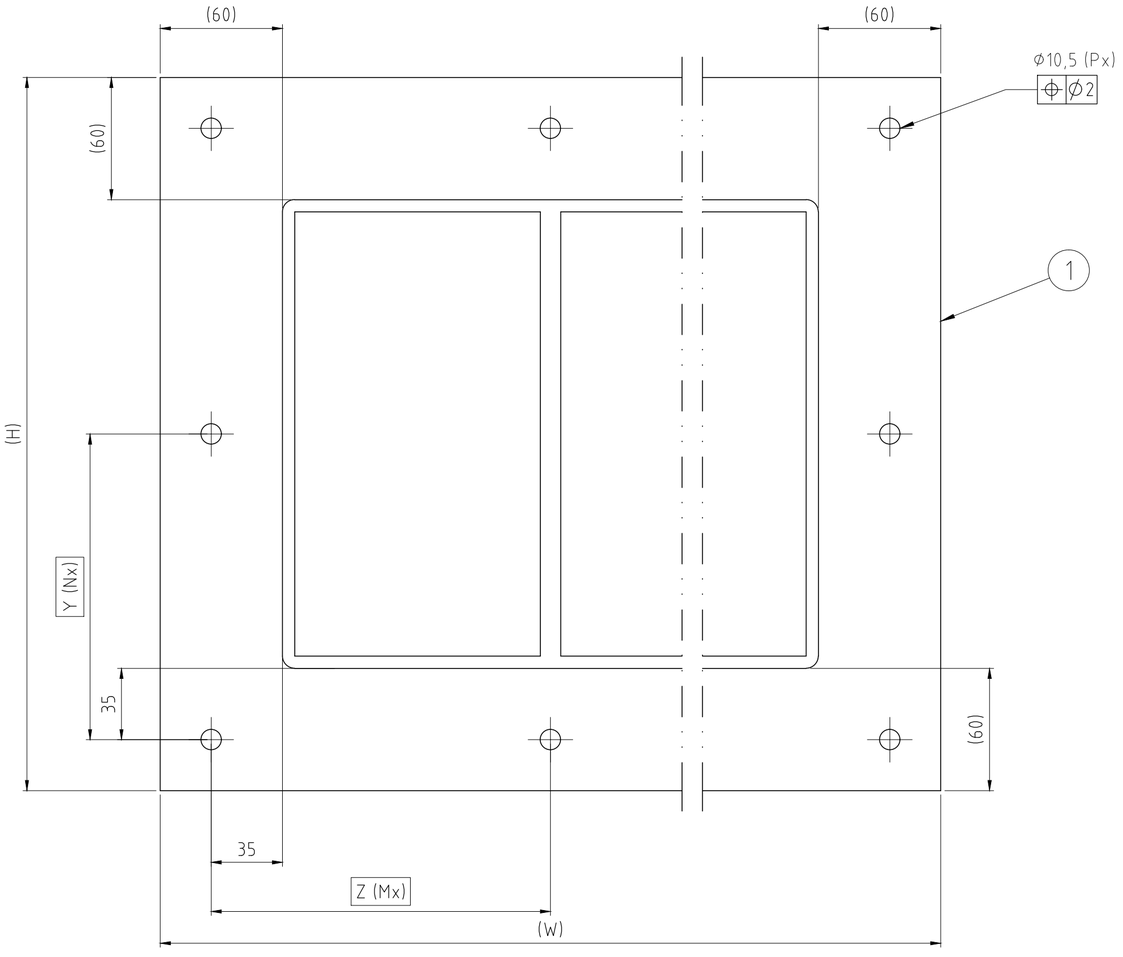
Port Hardy OPP-O-I

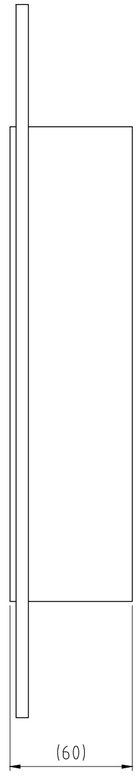
REV	CHANGE DESCRIPTION	ECN	DATE	REVISED BY	APPROVED BY





Pos	Amount	Description	Specification
	DKA/PCW		
	Design	Chd	Appd	Ref drawing	DAS / 2.102.20
					Vx proj
	06/12	CLXSks2.2-TON x 20ft Hol:16.46ft	1:30
	Date		
	(Calgary PCW)	Port Hardy OPP	M-film
	Dept		
Twin copy	KONECRANES	2 tonne TRSG, Span 20'-0'', Hol 17'-0''	
	KONECRANES CANADA INC.	Port Hardy OPP-O-I	Issue





TYPE	H	W	Z	M	Y	N	P
GH 2x2	233	383	166,5	2	183	1	6
GH 2x3	233	513,5	154,5	3	183	1	8
GH 2x4	233	644	148,5	4	183	1	10
GH 2x5	233	774,5	181,1	4	183	1	10
GH 2x6	233	905	171	5	183	1	12
GH 2x7	233	1035,5	164,2	6	183	1	14
GH 2x8	233	1166	159,4	7	183	1	16
GH 2x9	233	1296.5	155,8	8	183	1	18
GH 2x10	233	1427	153	9	183	1	20
GH 4x2	291,5	383	166,5	2	120,8	2	8
GH 4x3	291,5	513,5	154,5	3	120,8	2	10
GH 4x4	291,5	644	148,5	4	120,8	2	12
GH 4x5	291,5	774,5	181,1	4	120,8	2	12
GH 4x6	291,5	905	171	5	120,8	2	14
GH 4x7	291,5	1035,5	164,2	6	120,8	2	16
GH 4x8	291,5	1166	159,4	7	120,8	2	18
GH 4x9	291,5	1296.5	155,8	8	120,8	2	20
GH 4x10	291,5	1427	153	9	120,8	2	22
GH 6x2	350	383	166,5	2	150	2	8
GH 6x3	350	513,5	154,5	3	150	2	10
GH 6x4	350	644	148,5	4	150	2	12
GH 6x5	350	774,5	181,1	4	150	2	12
GH 6x6	350	905	171	5	150	2	14
GH 6x7	350	1035,5	164,2	6	150	2	16
GH 6x8	350	1166	159,4	7	150	2	18
GH 6x9	350	1296.5	155,8	8	150	2	20
GH 6x10	350	1427	153	9	150	2	22
GH 8x2	410	383	166,5	2	180	2	8
GH 8x3	410	513,5	154,5	3	180	2	10
GH 8x4	410	644	148,5	4	180	2	12
GH 8x5	410	774,5	181,1	4	180	2	12
GH 8x6	410	905	171	5	180	2	14
GH 8x7	410	1035,5	164,2	6	180	2	16
GH 8x8	410	1166	159,4	7	180	2	18
GH 8x9	410	1296.5	155,8	8	180	2	20
GH 8x10	410	1427	153	9	180	2	22

Rev	Type of revision	Date	Sign
B	UPDATED TITLE BORDER	2019-05-03	se-linado

Item	Qty	Designation	Specification	NetWeight
1	1	COMBINATION FRAME	S1005556	

General tolerances used for manufacturing shown in document DOC-60280

Designed by: se-ronpet | Created Date: 2007-01-02 | Latest save date: 2019-05-07 | Format: A2 | Scale: 1:2 | Sheet no | TotWeight: –

Roxtec
www.roxtec.com

Title: GH FRAME
COMBINATION FRAME

Projection method

Restricted due to: Information drawing

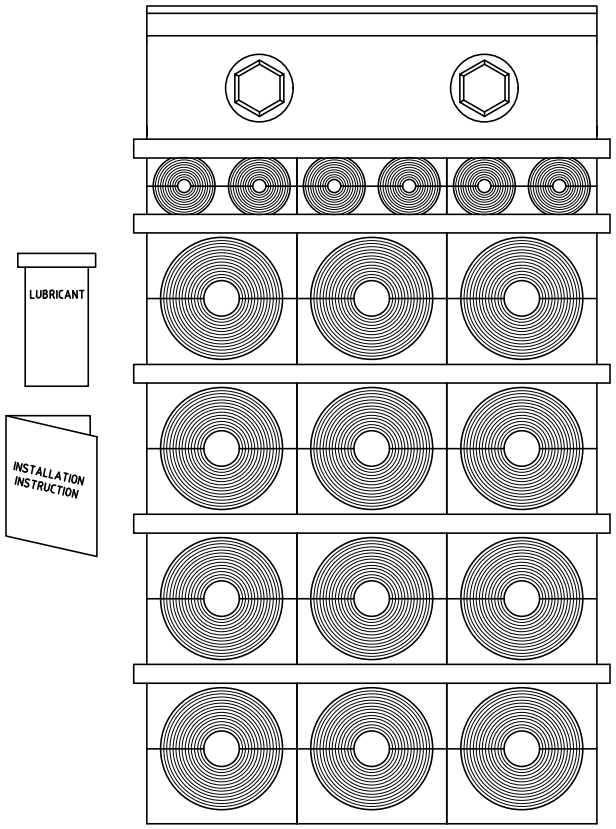
Drawing number: S1010383

Rev: B

Rev 2.0

Information drawings show general design and nominal dimensions if not else stated

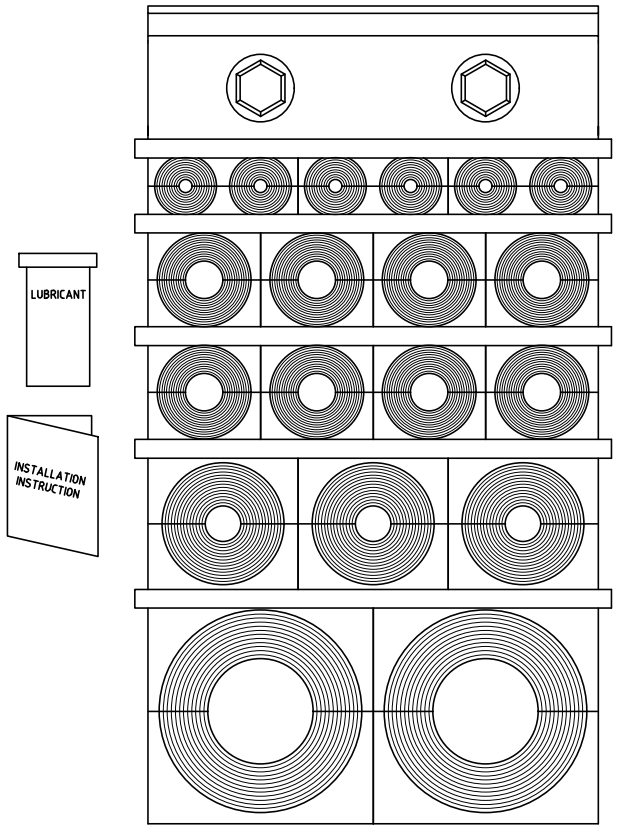
Rev 1.0



B

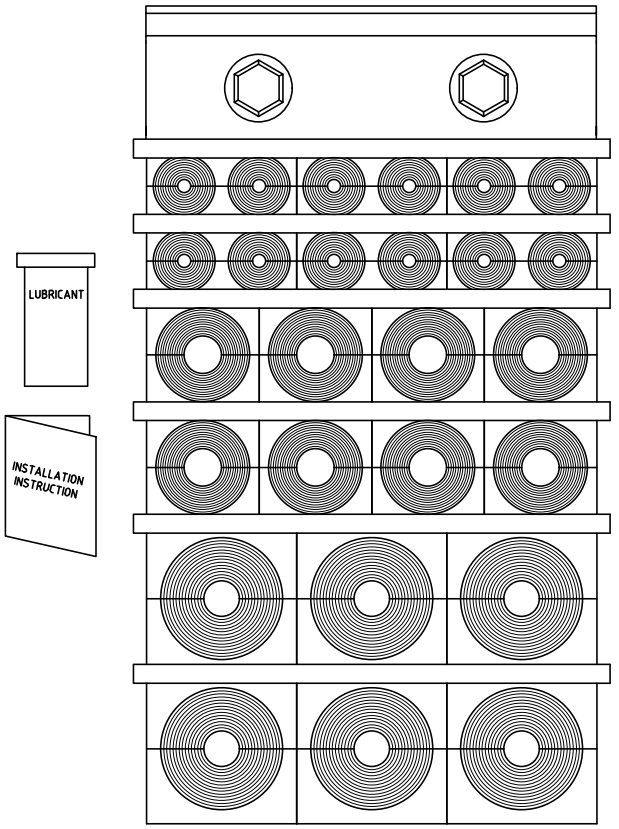
SEALING KIT 6/18

12x RM 40 10-32	RANGE Φ0+9,5-32,5
3x RM 20w40	RANGE Φ0+3,5-16,5
5x STAYPLATE	
1x WEDGE 120	
1x LUBRICANT	
1x INSTALLATION INSTRUCTION	



SEALING KIT 6/19

2x RM 60	RANGE Φ0+28-54
3x RM 40 10-32	RANGE Φ0+9,5-32,5
8x RM 30	RANGE Φ0+10-25
3x RM 20w40	RANGE Φ0+3,5-16,5
5x STAYPLATE	
1x WEDGE 120	
1x LUBRICANT	
1x INSTALLATION INSTRUCTION	



SEALING KIT 6/26

6x RM 40 10-32	RANGE Φ0+9,5-32,5
8x RM 30	RANGE Φ0+10-25
6x RM 20w40	RANGE Φ0+3,5-16,5
6x STAYPLATE	
1x WEDGE 120	
1x LUBRICANT	
1x INSTALLATION INSTRUCTION	

NOTE:
SEALING KITS ARE AVAILABLE IN GALVANIZED AND ACID PROOF STAINLESS STEEL VERSIONS.

Rev	Type of revision	Date	Sign
B	DESCRIPTION CHANGED.	2018-06-29	se-jenboh

Item	Qty	Designation	Specification	Net Weight
				Tot Weight: -

General tolerance ISO 2768-1/2-m/K EN ISO 13920-BF | Welded details EN ISO 5817-B EN ISO 10042-B | General surface roughness, Ra 12.5

Designed by: se-jenboh | Created Date: 2018-04-13 | Latest save date: 2018-06-29 | Format: A2 | Scale: 1:1 | Sheet no

Roxtec
www.roxtec.com

Title: SEALING KIT 6/18, 6/19, 6/26

Restricted due to: Information drawing

Drawing number: S1532066

Rev: B

Projection method

UL Product iQ™

XHEZ.W-L-3115 - THROUGH-PENETRATION FIRESTOP SYSTEMS

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

XHEZ - Through-penetration Firestop Systems
XHEZ7 - Through-penetration Firestop Systems Certified for Canada

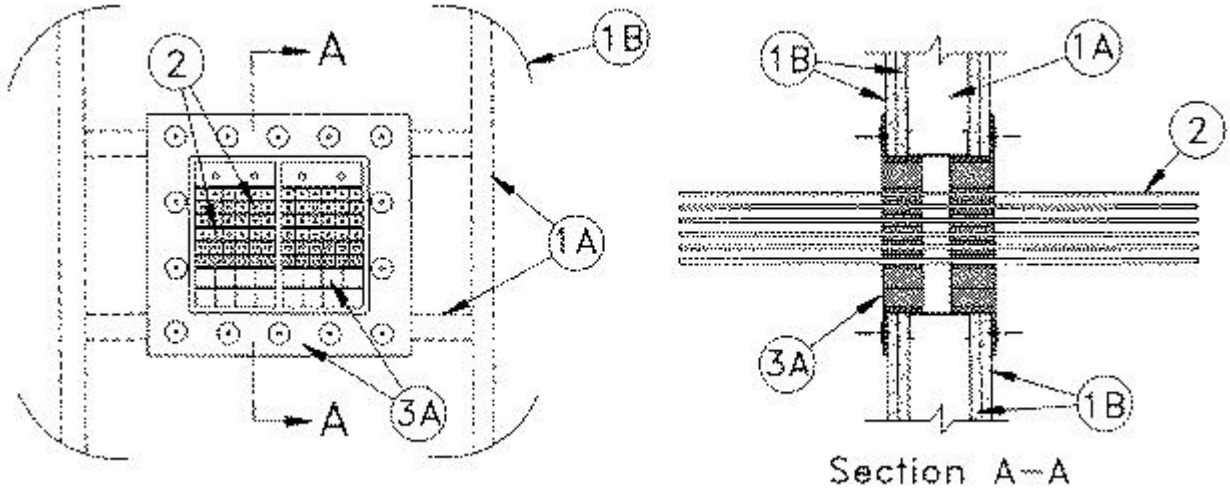
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. W-L-3115

February 29, 2016

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Ratings —1 and 1-1/2 Hr (See Item 2)	FT Ratings — 1 and 1-1/2 Hr (See Item 2)
L Rating At Ambient — Less Than 1 CFM/sq ft	FH Rating — 2 Hr
L Rating At 400 F — Less Than 1 CFM/sq ft	FTH Ratings — 1 and 1-1/2 Hr (See Item 2)
	L Rating At Ambient — Less Than 5.1 L/s/m^3
	L Rating At 400 F — Less Than 5.1 L/s/m^3



1. **Wall Assembly —** The 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. **Steel Studs —** Steel studs to be min 3-5/8 in. (92 mm) wide and spaced max 24 in. (610 mm) OC. Additional framing members to be installed to form a rectangular box having dimensions which are max 1/4 in. (6 mm) greater than the width and height of the firestop device frame (Item 3A), excluding mounting flanges. Max area of framed opening is 105 sq in. (677 cm^2) (SF-6X2 Device). Max dimension of framed opening is 12 in. (305 mm) (SF-8 Device).

B. **Gypsum Board* —** One layer of nom 5/8 in. (16 mm) thick gypsum wallboard, as specified in the individual Wall and Partition Design.

2. **Cables —** Cables to be rigidly supported on both sides of wall assembly. The following types and sizes of cables may be used:

A. Max 12 pair No. 22 AWG copper conductor communication cable with polyvinyl chloride insulation and jacket materials. **When max 12 pair No. 22 AWG communication cable is used, T Rating is 1-1/2 hr.**

B. Multiple fiber optical communication cables jacketed with polyvinyl chloride and having a max outside diam of 1/4 in. (6 mm). **When optical fiber communication cable is used, T Rating is 1-1/2 hr.**

C. Max 50 pair No. 24 AWG copper conductor communication cable with polyvinyl chloride insulation and jacket materials. **When max 50 pair No. 24 AWG communication cable is used, T Rating is 1 hr.**

3. **Firestop System —** The firestop system shall consist of the following:

A. **Firestop Devices* —** Firestop device consists of a rectangular steel frame, multi diameter elastomeric sealing modules, steel stay plates and a compression unit consisting of a ROX Wedge. The firestop device shall be inserted in the framed opening on one side of the wall assembly. The steel frame of the firestop device shall be secured to the steel stud framing of the wall assembly, through the gypsum wallboard layer, by means of No. 8 by min 2 in. (51 mm) long self-drilling, self-tapping steel screws and steel washers through holes spaced max 3-1/2 in. (89 mm) OC in the device frame mounting flange. The rectangular opening(s) of the device frame shall be filled with multiple rows of multi diameter elastomeric sealing modules with a max of one cable in each sealing module. The sheets of the multi diameter sealing modules halves are removed one by one until a max gap of 0.04 in. (1 mm) is formed between the two module halves. When the number of sealing modules exceeds the number of cables, the solid cylindrical cores of the unpenetrated multi diameter sealing modules shall be left in place or "blank" (solid) sealing modules shall be used. During installation of the elastomeric sealing modules, thin steel stay plates shall be used to separate the rows of sealing modules and to retain the sealing modules within the steel frame. After installation of the modules, the bolts of the compression unit are tightened to form an effective seal around the through penetrants and insert modules. The firestop device shall be installed in accordance with the accompanying installation instructions.
ROXTEC INC — B-2x1, B-4x1, B-6x1, B-8x1, G-2X1, G-2X2, G-4X1, G-4X2, G-6X1, G-6X2, G-8X1, GH-2X1, GH-2X2, GH-4X1, GH-4X2, GH-6X1, GH-6X2, GH-8X1, GHM-2X1, GHM-2X2, GHM-4X1, GHM-4X2, GHM-6X1, GHM-6X2, GHM-8X1, GH BG-2X1, GH BG-2X2, GH BG-4X1, GH BG-4X2, GH BG-6X1, GH BG-6X2, GH BG-8X1, GHM BG-2X1, GHM BG-2X2, GHM BG-4X1, GHM BG-4X2,

GHM BG-6X1, GHM BG-6X2, ,GHM BG-8X1, GOH-2x1, GOH-4x1, GOH-6x1, GOH-8x1, GKOH-2x1, GKOH-4x1, GKOH-6x1, GKOH-8x1, SF-2x1, SF-2X2, SF-4x1, SF-4X2, SF-6x1, SF-6X2, SF-8x1

ROXTEC INTERNATIONAL AB — B-2x1, B-4x1, B-6x1, B-8x1, G-2X1, G-2X2, G-4X1, G-4X2, G-6X1, G-6X2, G-8X1, GH-2X1, GH-2X2, GH-4X1, GH-4X2, GH-6X1, GH-6X2, GH-8X1, GHM-2X1, GHM-2X2, GHM-4X1, GHM-4X2, GHM-6X1, GHM-6X2, GHM-8X1, GH BG-2X1, GH BG-2X2, GH BG-4X1, GH BG-4X2, GH BG-6X1, GH BG-6X2, GH BG-8X1, GHM BG-2X1, GHM BG-2X2, GHM BG-4X1, GHM BG-4X2, GHM BG-6X1, GHM BG-6X2, ,GHM BG-8X1, GOH-2x1, GOH-4x1, GOH-6x1, GOH-8x1, GKOH-2x1, GKOH-4x1, GKOH-6x1, GKOH-8x1, SF-2x1, SF-2X2, SF-4x1, SF-4X2, SF-6x1, SF-6X2, SF-8x1

B. **Silicone RTV Sealant —** (Not Shown) — A min 1/4 in. (6 mm) diam bead of silicone RTV sealant shall be applied as a gasket between the device frame mounting flange and the gypsum wallboard. The sealant bead shall be located between the edge of the opening and the line of fasteners around the entire perimeter of the framed opening.

B1. **Butyl Rubber Gasket —** (Not Shown) — As an alternate to the RTV sealant, a nom 5/16 in. (8 mm) thick by 5/16 in. (8 mm) wide butyl rubber gasket with self-adhesive may be installed around the mounting flange. The gasket shall be recessed in approx 1/2 in. (13 mm) and 2 in. (51 mm) from the perimeter of the device frame mounting flange such that the continuous gasket bracket the line of fasteners along each side of the device.

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Last Updated on 2016-02-29