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ENGINEER TEST CONSULT

ROOF SYSTEM ASSESSMENT REPORT DYNAMIC UPLIFT RESISTANCE PER CSA A123.21			
CUSTOMER:	Amrize Building Envelope LLC (Duro-Last)	TEST DATE:	2017-06-28
DOCUMENT NO.	DL-MARS-4	PUBLICATION DATE:	2025-07-10
TEST PANEL NO.	DRL-D1C	REVISION NO.	2
SYSTEM TYPE:	D-1	REEVALUATION DATE:	2028-07-09

MECHANICALLY ATTACHED ROOFING SYSTEM (MARS) SUMMARY	
ROOFING SYSTEM SUMMARY:	
Roof Cover:	PVC single ply, mechanically fixed, in-lap
Slip Sheet:	Needle punched polyester/polypropylene non-woven fabric
Insulation (top):	Expanded polystyrene foam board, mechanically fixed
Insulation (base):	(Optional) expanded polystyrene or polyisocyanurate foam board, loose-laid
Vapor Barrier:	SBS modified bitumen with tri-laminated woven polyethylene film surface, self-adhering
Thermal Barrier:	Gypsum-based board, loose-laid, adhered or mechanically fixed
Deck:	steel

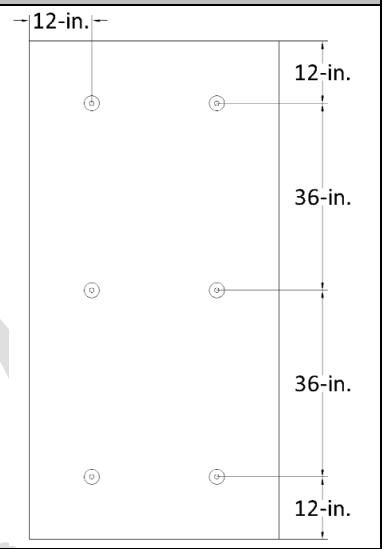
DYNAMIC UPLIFT RESISTANCE PER CSA A123.21:

Sustained Test Value		Design Value CSA A123.21:20 (*Test Value x 0.65*)		Design Value CSA A123.21:14 (*Test Value ÷ 1.5*)	
kPa	**psf**	**kPa**	**psf**	**kPa**	**psf**
-3,1	-64	-2,0	-42	-2,0	-43

PRODUCTS / APPLICATION:

Roof Cover:	Description:	Membrane composed of polyester reinforcement coated with PVC compound	
	Application:	Mechanically fixed	
	Eligible Products:	Duro-Tuff (min. nominal 50-mil)	
Roof Cover Fasteners:	Description:	Corrosion resistant screw-type roofing fasteners with steel stress plates	
	Fixing Method:	Parts spaced max. 305-mm (12-inch) o.c. within the min. 152-mm (6-inch) wide side laps, spaced max. 1.4-m (54-inch) o.c. Side laps sealed with 1.5-inch heat weld.	
	Fixing Density:	1 part per 0.42 m^2 (4.5 ft^2)	
	Eligible Products:	Duro-Last #15 Extra Heavy Duty Fastener with Duro-Last Poly-Plates or Duro-Last Cleat Plates	
Slip Sheet:	Description:	Needle punched polypropylene non-woven fabric	
	Application:	Loose-laid	
	Eligible Products:	Duro-Last Geotextile slip sheet	
Insulation (top):	Description:	Expanded polystyrene foam board	
	Application:	Mechanically fixed	
	Eligible Products:	**Product**	**Min. Thickness**
		Duro-Guard EPS Type II-C or Duro-Guard EPS FGF	13-mm (0.5-inch)

PRODUCTS/APPLICATION (CONTINUED):

<table>
<tr><td rowspan="4">Insulation (top) Fasteners:</td><td>Description:</td><td colspan="3">Corrosion resistant screw-type roofing fasteners with steel stress plates</td><td rowspan="3"> 
</td></tr>
<tr><td>Fixing Method:</td><td colspan="3">Fasteners installed through stress plates, positioned to engage the top flange of the steel deck</td></tr>
<tr><td>Fixing Rate:</td><td colspan="3">1 part per 0.49 m^2 (5.3 ft^2)
6 parts per 1220 x 2438 (48 x 96-inch) board</td></tr>
<tr><td>Eligible Products:</td><td colspan="2">Fasteners
Duro-Last #14 Heavy Duty Fastener</td><td>Plates
Duro-Last 3-inch Metal Plate</td></tr>
<tr><td rowspan="3">Insulation (base): (Optional)</td><td>Description:</td><td colspan="3">Expanded polystyrene or polyisocyanurate foam board</td></tr>
<tr><td>Application:</td><td colspan="3">One or more layers, loose-laid with staggered joints</td></tr>
<tr><td>Eligible Products:</td><td colspan="3">Product
Duro-Guard ISO II-A, Duro-Guard ISO II-E2, Duro-Guard ISO II-H, Duro-Guard ISO III-A, Duro-Guard ISO III-E2, Duro-Guard ISO III-H, Duro-Guard EPS Type II-C or Duro-Guard EPS FGF</td></tr>
<tr><td rowspan="3">Vapour Barrier:</td><td>Description:</td><td colspan="3">SBS modified bitumen with tri-laminated woven polyethylene film surface</td></tr>
<tr><td>Application:</td><td colspan="3">Self-adhering</td></tr>
<tr><td>Eligible Products:</td><td colspan="3">Duro-Last Vapor Barrier</td></tr>
<tr><td rowspan="4">Thermal Barrier:</td><td>Description:</td><td colspan="3">Gypsum-based board</td></tr>
<tr><td>Application:</td><td colspan="3">Loose-laid, adhered or mechanically-fixed</td></tr>
<tr><td rowspan="2">Eligible Products:</td><td>By</td><td>Product</td><td>Min. Thickness</td></tr>
<tr><td>Georgia-Pacific Gypsum</td><td>DensDeck Prime</td><td>6.4-mm (0.25-inch)</td></tr>
<tr><td>Deck:</td><td>Tested Product:</td><td colspan="3">Steel roof deck</td></tr>
</table>

NOTES:	
Test Value and Design Value:	The "Test Value" noted herein reflects the ultimate passing test pressure recorded during testing. The "Design Value" herein reflects the "Test Value" multiplied by a resistance factor of 0.65 (same as "Test Value" divided by a safety factor of 1.5) The "Design Value" should meet or exceed the design pressure requirements of the project, as determined in accordance with the current National Building Code of Canada (NBC) requirements.
Equivalence of Other Products:	This report applies only to the products listed as "Eligible Products" herein.
Optional Components:	Components listed herein as "optional" may be removed from the roof system design with no adverse effect on system dynamic wind uplift performance.
As-Tested Deck:	Testing utilized 22 ga., Type B (6-inch deck module) steel deck meeting ASTM A653, A792, A1008 or CSSBI 10M standard and having a yield strength of 275 MPa (40-ksi). Alternate deck displaying equivalent strength and fastener-holding capacity (withdrawal resistance) may be specified at the discretion of the Designer of Record to the satisfaction of the Authority Having Jurisdiction.

Fastener Point-Loads:	Roof Cover Point-Load				Insulation Point-Load			
	Sustained Test Value		Design Value		Sustained Test Value		Design Value	
	N	lbf	N	lbf	N	lbf	N	lbf
	1281	288	833	187	1517	341	986	222

RSAR SCOPE

Roof System Assessment Reports (RSAR) constitute a summary of allowable products and interfaces used in low-slope roof assemblies based testing in accordance with CSA A123.21 at our ISO/IEC 17025 accredited laboratory.

While RSAR's are reviewed and renewed each 3-years based primarily on report holder declaration, these are not Certification listings, and are not intended to state or imply ongoing quality control / surveillance activities by NEMO at the report holder's facilities.

NEMO ETC, LLC is not, in any way, the Designer of Record for any project on which these RSAR's, or previous versions thereof, is/was used for permitting or design guidance. RSAR's are not to be construed as representing any attributes not specifically listed, nor to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by NEMO ETC, LLC, express or implied, as to any finding or other matter in these RSAR's, or as to any product covered by the RSAR's.

NEMO ETC CREDENTIALS

TYPE	ENTITY	REFERENCE
ISO/IEC 17025 Accreditation	International Accreditation Service (IAS)	TL-689
TAS 301 Certification	Miami-Dade	21-0409.01
Third Party Test Data Program	UL, LLC	DA2862
Test Lab Listing	Roofing Contractors Association of British Columbia	RCABC Labs

REPORT HISTORY

DATE	EVENT	NOTES	AUTHORIZED BY:
2021-01-11	FINAL	None	RN
2022-07-12	REV1	Re-Validation	RN
2025-07-10	REV2	Re-Validation, reformat, add insulation options	RN

END OF REPORT