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EVALUATION OF CONSOLAID INC. FLEX-FENCE® LOUVERED SYSTEM FOR ELEMENTS WITHIN GUARD LOAD RESISTANCE REFERENCING OBC – 2024, SECTION 9.8.8.2 (3)

Report to:	Consolaid Inc. 55 West Beaver Creek Road, Unit 11 Richmond Hill, Ontario, L4B 1K5 Canada
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Report No.:	25-06-B0091 3 Pages, 1 Appendices
Proposal No.:	25-006-698510
Date:	October 14, 2025

1.0 INTRODUCTION

At the request of Consolaid Inc., Element Materials Technology was retained to conduct an elements within guards load resistance performance evaluation of a louvered system identified as the "Flex-Fence® Louvered System" referencing the 2024 Ontario Building Code (OBC) Section 9.8.8.2 (3) as outlined in Proposal No. 25-006-698517.

Element Sample Number	Sample Description
25-06-B0091	Flex-Fence® Louvered System, Loading Sample

Note: Sample information provided by the client can affect the validity of results

1.0 PROCEDURE

The elements within guards load testing was performed following the requirements of the 2024 OBC Section 9.9.8.2 (3).

The assembly submitted for testing consisted of eleven (11) operable louvers made from wood with PVC hardware (numbered 1 to 11 from left side of the frame in setup position). The loads were applied over an area of 300 mm x 300 mm, at critical locations within the louvered area.

The assembly was secured on the test rig and an applied load of 1.25 kN (0.5 kN design load x 2.5 safety factor) *was applied using a calibrated load cell and a 300 mm by 300 mm fixture adapter (fixture captures 3 louvers). The louvers were closed and the required horizontal load in the outward direction was applied at three locations (lovers 2, 3, 4, louvers 5, 6, 7 and louvers 9, 10, 11), at mid span between top and bottom attachments. The loading locations were selected as to produce the most critical effect in the system.

The applied force was maintained for 1 minute while observing the sample for failures. The applied load was removed, and the sample was inspected for failures and visible permanent deformations.

The photos of the test set-up are presented in Figure A1.

Note: * A safety factor of 2.5 was selected as a limit state safety factor was not available for the system tested.

2.0 TEST DATES

Specimen Number	Test	Testing Date
25-06-B0091	Horizontal Load Applied Outward on Elements Within the *Guard,* Including Solid Panels and Balusters	September 3, 2025

2.1 Equipment Calibration List

Equipment	Element MII Number	Calibration Date
Load Cell	P00203	12/16/2025
Stopwatch	P00153	03/07/2026

3.0 RESULTS

The results from FLEX-Fence® Louvered Hardware evaluation are summarized in Table 1 below.

Table 1 – Static Loading Results
Louvers In Closed Position
Element Specimen No.: 25-06-B0085-4

Test Louver	Test Location	Load Applied (KN)	Results
Louvers 2-4 from Left Side	Mid-span between top and bottom attachments	1.25	Guard system sustained 1.25KN load for 1 minute without failures; No visible deformation with load removed
Louvers 5-7 at Centre	Mid-span between top and bottom attachments	1.25	Guard system sustained 1.25KN load for 1 minute without failures; No visible deformation with load removed
Louvers 9-11 from Left Side	Mid-span between top and bottom attachments	1.25	Guard system sustained 1.25KN load for 1 minute without failures; No visible deformation with load removed

During and after testing was completed, the system showed no sign of fastener failure, cracking, or any other failure modes.

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4.0 CONCLUSION

Based on the test results, the Consolaid Inc. Flex-Fence® Louvered System, Specimen No.: 25-06-B0085-4, meets the applicable "Loads on Guards" requirements of the 2024 Ontario Building Code Section 9.8.8.2(3) for guards within dwelling units and exterior guards serving not more than two dwelling units using a safety factor of 2.5.

5.0 REPORT REVISION SUMMARY

Report No.:	**Date:**	**Description of Revisions:**
25-06-B0091	October 14, 2025	Original Document

Reported by:

Jacob Willock, B.Tech.
Technologist, Building Systems
Building Science Division

Reviewed by:

Scott Hallam, B.Eng.
Building Systems Manager
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LICENSED PROFESSIONAL ENGINEER
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2025.10.14
PROVINCE OF ONTARIO

APPENDIX A

Flex-Fence® Sample Test Setup

(1 Page)

Figure A1: Flex-Fence® Sample with Static Load Applied

APPENDIX B

Flex-Fence® Installation Guide
(Client Supplied)

(4 Pages)

FLEX·fence®

www.flexfence.com

Each *FLEX·fence*® 4ft. kit includes: 2 pcs. 4 ft. pre-punched rails, 1 pc 4ft. operating bar, 22 brackets, all fastening hardware.

THE INSTRUCTIONS HAVE BEEN WRITTEN FOR FENCE OR DECK RAILING USE. THE INSTRUCTIONS CAN BE EASILY ADAPTED FOR OTHER APPLICATIONS.

Each package of ***FLEX·fence***® has been designed to operate for openings of 48 inches (maximum of 48 inch centers). If your opening is shorter, larger, or if you want no gap when the boards in a closed position see Section B reverse side.

Les ensembles *FLEX·fence*MD de 4 pi comprennent : 2 rails de 4 pi prépercés, 1 barre de manœuvre de 4 pi, 22 supports, toutes les pièces de fixation.

CES DIRECTIVES S'APPLIQUENT À L'UTILISATION COMME CLÔTURE OU BALUSTRADE DE TERRASSE. ELLES PEUVENT CEPENDANT ÊTRE FACILEMENT ADAPTÉES POUR D'AUTRES APPLICATIONS.

Chaque ensemble ***FLEX·fence***MD est conçu pour fonctionner dans des ouvertures de 48 pouces (entre-axes d'un maximum de 48 pouces). Si l'ouverture de la clôture est plus petite ou plus grande, ou si on souhaite qu'il n'y ait pas de brèche lorsque les planches sont en position fermée, voir la section B au verso.

STEP 1 Determine if you wish to install your ***FLEX·fence***® as either vertical *(Figure 1)* or horizontal *(Figure 2)* panels.

ÉTAPE 1 Déterminer si on souhaite installer le système ***FLEX·fence***MD à la verticale *(Figure 1)* ou à l'horizontale *(Figure 2)*.

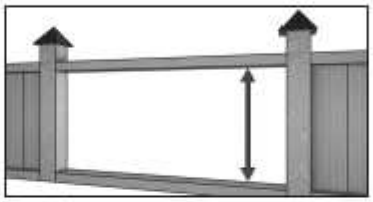


Figure 1

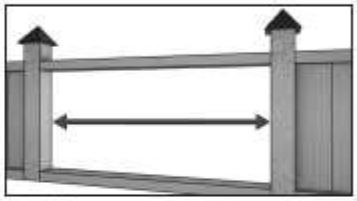


Figure 2

STEP 2 Fit rails onto top and bottom *(Figure 1)* crossbar or fence post *(Figure 2)*. Using a marking instrument denote rail placement ensuring that they are well centered and the pre-punched swivel holes are directly opposite to one another *(Figure 3)*.

ÉTAPE 2 Fixer les rails sur les barres transversales du haut et du bas *(Figure 1)* ou sur les poteaux de clôture *(Figure 2)*. Marquer l'emplacement des rails en s'assurant de bien les centrer* (Figure 3A) et de placer les trous directement l'un en face de l'autre *(Figure 3)*.*

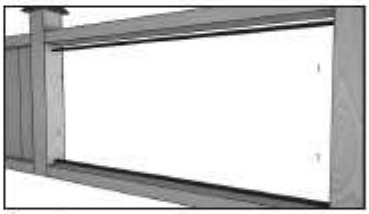


Figure 3

Figure 3A

NOTE: You may wish to use our location holes for position purposes during the installation (figures 3 & 3A).
REMARQUE : on peut utiliser les trous de positionnement comme guides durant l'installation (figures 3 et 3A).

* If you are attaching the rails onto 2" x 6" frames the rails should not be centered but offset on one side to allow access to fasten the operating bar (See STEP 6).
* Si on fixe les rails sur des planches de 2 po x 6 po, on ne doit pas les centrer sur la largeur de la planche, mais les décaler pour permettre de fixer la barre de manœuvre (voir l'ÉTAPE 6).

STEP 3 Once the rails have been positioned, mount a bracket onto one of the middle pre-punched swivel holes on each rail by using the rail screws supplied (#10, 1½ inch) *(Figure 4)*. Drive the screw perpendicular through the bracket hole and matching rail swivel hole, in order to hold the bracket and rail in place.

ÉTAPE 3 Une fois les rails en place, fixer un support sur l'un des trous prépercés au milieu de chaque rail à l'aide des vis fournies (no 10, 1 po 1/2) *(Figure 4)*. Visser la vis perpendiculairement à travers le trou du support et le trou du rail afin de fixer le support et le rail en place.

Figure 4

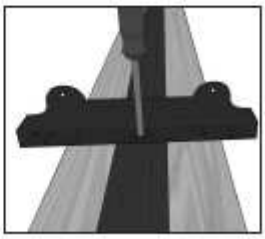


Figure 4A

Figure 4B

IMPORTANT: REVERSE SCREW BY 1/4 OF TURN, JUST ENOUGH TO ALLOW THE BRACKETS TO TURN EASILY (SWIVEL).
NOTE: When fastening the brackets onto the rails, ensure that the side of the bracket that have two end position holes are facing the same direction.

IMPORTANT : DÉVISSER LA VIS D'UN QUART DE TOUR, JUSTE ASSEZ POUR PERMETTRE AUX SUPPORTS DE TOURNER FACILEMENT (PIVOTER).
REMARQUE : Lorsqu'on visse les supports sur les rails, il faut s'assurer que les côtés présentant deux trous sont orientés dans la même direction.

Figure B1: Installation Guide, Section A

STEP 4 Taking a piece of 1" x 6" fence boards or 5/4" deck boards, cut to length 1/16th to 1/8th inches shorter than the distance of the opposing brackets. Fit the boards onto the brackets, and secure with the mounting screws supplied (#8, 5/8 inch) *(Figure 5)*. Ensure the mounting bracket screw slots are facing inside your enclosed area *(Figure 4A)*.

ÉTAPE 4 Prendre une planche de 1 x 6 et la couper à la longueur requise, soit 1/16 à 1/8 de pouce plus court que la distance entre les supports opposés. Fixer la planche sur les supports à l'aide des vis fournies (no 8, 5/8 po) *(Figure 5)*. S'assurer que les trous de vis sur le dessus des supports sont orientés vers l'intérieur de l'aire clôturée *(Figure 4 A)*.

Figure 5

STEP 5 Mount the remaining brackets and boards onto the rails following STEPS 3 & 4.

ÉTAPE 5 Installer les autres supports et les autres planches sur les rails en suivant les ÉTAPES 3 et 4.

STEP 6 To install operating bar, turn the boards outward and parallel to one another, with the top holes at the end of the bracket facing inwards towards your enclosed area. Fasten the pre-punched operating bar onto the bracket using the bar screws supplied (#6, 3/4 inch) ensuring the lip of the operating bar is facing upwards *(Figure 6)*.

To prevent the chances of wood splitting, it is highly recommended that pilot holes are drilled wherever screws are being inserted into wood.

ÉTAPE 6 Pour installer la barre de manœuvre, tourner les planches vers l'extérieur et les placer en parallèle, les trous de vis sur le dessus des supports orientés vers l'aire clôturée. Visser la barre de manœuvre prépercée sur les supports à l'aide des vis fournies (no 6, 1 po), en s'assurant que le rebord de la barre de manœuvre est orienté vers le haut *(Figure 6)*.

Pour éviter les risques de fendillement du bois, il est fortement recommandé de percer des trous de guidage partout où l'on insère des vis dans le bois.

Figure 6

Figure B2: Installation Guide, Section A Continued

SECTION B
OPENINGS OTHER THAN FOUR FEET / OUVERTURES AUTRES QUE DE QUATRE PIEDS

Measure the distance from the end brackets (closed position) to the post and cut a strip of wood that will easily fit the gap and mount onto the post or crossbars (Figure 7) or see dimension chart note section. NOTE: *FLEX•fence*® has been designed to allow only a maximum of 4 inch gap (in open position) between boards.

Mesurer la distance entre le support se trouvant à l'extrémité (en position fermée) et le poteau, puis couper une planche à la largeur requise pour combler l'ouverture. Fixer la planche sur le poteau ou sur les barres transversales (Figure 7) ou consulter la section des remarques dans le tableau des dimensions. NOTA : le système *FLEX•fence*MD est conçu pour permettre un espace maximal de 4 pouces (en position ouverte) entre les planches.

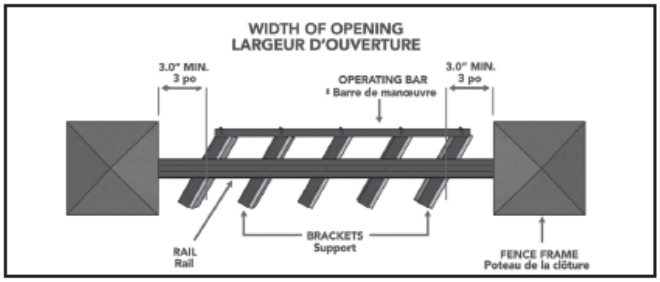


Figure 7

***FLEX•fence*® DIMENSION GUIDE* / Guide de dimensions* *FLEX•fence*MD**

Distance of your opening to be *FLEX•fence'd* ** / Grandeur de l'ouverture à fermer avec *FLEX•fence*MD **	12 in/po	24 in/po	30 in/po	36 in/po	42 in/po	48 in/po	54 in/po	60 in/po	66 in/po	72 in/po	84 in/po	96 in/po
# of (1"x 6") boards you will require / Nbr de planches (1 po x 6 po) dont vous aurez besoin.	2	5	6	8	9	11	12	14	15	17	20	23
NOTE: Kits can be easily cut to size / **Nota: On peut facilement couper le matériel à la grandeur voulue.**	**ONE 4 FT KIT:** When shortening rails, cut equal lengths from each end / **UNE TROUSSE DE 4 pi :** Pour raccourcir les rails, couper des longueurs égales aux deux extrémités.						**SECOND KIT REQUIRED:** Cut adjoining ends to create a 4" space between centre holes / **UNE DEUXIÈME TROUSSE EST NÉCESSAIRE :** Couper les extrémités adjacentes pour créer un espace de 4 po entre les trous centraux.					

* Guide Purposes only ** Other distance openings found inside with instructions
* À titre de référence seulement ** Autres grandeurs d'ouverture dans les instructions ci-incluses

1. To determine # of 1"x6" boards required:
   - Divide total opening width by four (4) and round to the nearest whole number (for .5 round to lower number) then subtract one (1).
   EG. FOR A 31" WIDE OPENING: 31" ÷ 4 = 7.75, ROUND TO 8 - 1 = **7 BOARDS**
2. To determine distance from frame/post to first hole in *FLEX•fence*® rail:
   - Subtract one (1) from number of boards required, then multiply by 4"
   - Subtract this number from the total width of the opening, then divide by two (2).
   EG. FOR A 31" OPENING THAT REQUIRES 7 BOARDS: 7 - 1 = 6 X 4" = 24", 31" OPENING - 24" = 7" ÷ 2 = **3.5" FROM FRAME TO FIRST HOLE IN RAIL**

1. Pour déterminer le nombre de planches requises de 1 po x 6 po :
   - Diviser la largeur totale de l'ouverture par quatre (4) et arrondir au chiffre entier le plus proche (pour 0,5 arrondir au chiffre inférieur), puis soustraire un (1).
   P. EX. : POUR UNE OUVERTURE DE 31 PO DE LARGE : 31 PO ÷ 4 = 7,75; ARRONDIR À 8 - 1 = 7 PLANCHES
2. Pour déterminer la distance entre le cadre/poteau et le premier trou du rail *FLEX•fence*MD :
   - Soustraire un (1) du nombre requis de planches, puis multiplier par 4 po.
   - Soustraraire ce nombre de la largeur totale de l'ouverture, puis diviser par deux (2).
   P. EX. : POUR UNE OUVERTURE DE 31 po NÉCESSITANT 7 PLANCHES : 7 - 1 = 6 x 4 po = 24 po,
   OUVERTURE DE 31 po - 24 po = 7 po ÷ 2 = 3,5 po ENTRE LE CADRE/POTEAU ET LE PREMIER TROU DU RAIL.

WARNING: If you size *FLEX•fence*® always cut the rails and operating bar with hand tools and never with power tools.

MISE EN GARDE: Pour couper le *FLEX•fence*MD à la dimension voulue, toujours couper les traverses et la barre de manœuvre à l'aide d'outlls manuels et jamais à l'aide d'outils électriques.

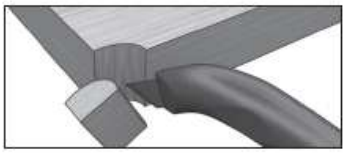
Figure B3: Installation Guide, Section B

SECTION C

IMPORTANT: If the 1" x 6" boards are wider than the ***FLEX•fence***® brackets (> 5½ inches). Either:
IMPORTANT : Si les planches de 1 po x 6 po sont plus larges que les supports ***FLEX•fence***MD (> 5,5 po), on peut:

1) Slightly notch the board edges to allow for fitting into the bracket.

1) Entailler légèrement les coins des planches afin qu'elles s'insèrent parfaitement dans les supports.



2) With a pair of pliers snap off 1 end cap per bracket.

2) Avec des pinces, enlever une des extrémités des supports.

SECTION D

#6 X 3/4" 11 screws – 1 per operating bar
(for bracket end hole-one side only)

#6 X 3/4 po 11 vis – 1 par barre de fonctionnnement
(pour trou à extrémité du support, un côté seulement)

#8 X 5/8" 44 screws – 2 per bracket
(for bracket side holes in 1x6 fence boards)

#8 X 5/8 po 44 vis – 2 par support
(pour trous sur le côté du support dans les clôture de 1 x 6)

#10 X 1½" 22 screws – 1 per bracket
(center hole of bracket into prepunched rail hole)

#10 X 1½ po 22 vis – 1 par support
(trou central du support danse le trou pré-perforé de la lisse)

USE WITH EITHER PHILLIPS OR ROBERTSON SCREWDRIVERS

COMPATIBLE AVEC TOURNEVIS PHILLIPS & ROBERTSON

Manufactured in / Fabriqué à Richmond Hill, ON – L4B 1K5
Printed in / Imprimé au Canada

Figure B4: Installation Guide, Section C