



NRC Publications Archive Archives des publications du CNRC

Siding Costs on NHBA Mark IV House Hansen, A. T.

For the publisher's version, please access the DOI link below./ Pour consulter la version de l'éditeur, utilisez le lien DOI ci-dessous.

Publisher's version / Version de l'éditeur:

<https://doi.org/10.4224/20358966>

Technical Note (National Research Council of Canada. Division of Building Research), 1968-02-01

NRC Publications Record / Notice d'Archives des publications de CNRC:

<https://nrc-publications.canada.ca/eng/view/object/?id=bac8f61f-0deb-483d-a6e1-0e0d8dcba422>

<https://publications-cnrc.canada.ca/fra/voir/objet/?id=bac8f61f-0deb-483d-a6e1-0e0d8dcba422>

Access and use of this website and the material on it are subject to the Terms and Conditions set forth at

<https://nrc-publications.canada.ca/eng/copyright>

READ THESE TERMS AND CONDITIONS CAREFULLY BEFORE USING THIS WEBSITE.

L'accès à ce site Web et l'utilisation de son contenu sont assujettis aux conditions présentées dans le site

<https://publications-cnrc.canada.ca/fra/droits>

LISEZ CES CONDITIONS ATTENTIVEMENT AVANT D'UTILISER CE SITE WEB.

Questions? Contact the NRC Publications Archive team at

PublicationsArchive-ArchivesPublications@nrc-cnrc.gc.ca. If you wish to email the authors directly, please see the first page of the publication for their contact information.

Vous avez des questions? Nous pouvons vous aider. Pour communiquer directement avec un auteur, consultez la première page de la revue dans laquelle son article a été publié afin de trouver ses coordonnées. Si vous n'arrivez pas à les repérer, communiquez avec nous à PublicationsArchive-ArchivesPublications@nrc-cnrc.gc.ca.





NATIONAL RESEARCH COUNCIL OF CANADA

DIVISION OF BUILDING RESEARCH

No.
516

TECHNICAL NOTE

L I M I T E D D I S T R I B U T I O N

PREPARED BY

A. T. Hansen

CHECKED BY

G. O. H.

APPROVED BY

N. B. H.

DATE

February 1968

PREPARED FOR

NHBA Research Committee

SUBJECT

SIDING COSTS ON NHBA MARK IV HOUSE

The siding on the NHBA Mark IV house, consisting of latex painted kraft paper glued directly to the plywood sheathing, was originally installed in June 1964. Subsequent to the original application, the glue bond between the paper and plywood deteriorated. Although the painted paper itself was generally in good condition, it had become torn in several places where it had separated from the plywood. In only a few places had the glue bond to the paper remained good.

DESCRIPTION OF FINISHES

It was decided by the NHBA Research Committee to replace the original siding to improve the exterior appearance. It was also decided to take this opportunity to try several different types of exterior finishes which seemed to have economic possibilities.

These included a factory-applied colored sheet vinyl material, field painted kraft paper applied with a waterproof adhesive (carboxylated-butadiene-styrene), and a check-resistant prime coat of paint with two coats of latex paint. A regular three-coat application of latex paint was also applied to enable a comparative evaluation of the performance of the check-resistant primer. All finishes were applied to 4- by 8-ft sheets of 3/8 in.

For

thick sanded Douglas-fir plywood. The panels were applied so as to provide exposure of each type of finish on each of the four exterior walls.

The kraft paper was applied indoors to the plywood using paint rollers to spread the adhesive on the pre-dampened paper. Immediately after the paper had been applied, the panels were stacked, weighted down to assist glue adhesion, and delivered to the site after the glue had set.

All original plywood panels were removed from the Mark IV house before the application of the new siding, which was installed in August 1967.

SCOPE OF STUDY

Records were kept of labour and material costs for the application of the new siding and battens. The labour required for the removal of the old siding, calking around windows, miscellaneous painting and other similar items not related to the new sidings is not included in this report.

Material costs and labour rates used in computing the total cost are listed in Table I. The labour costs used were the prevailing labour rates in Ottawa for the trades involved plus 10%, to take into account employer contributions to holiday pay, workmen's compensation and other fringe benefits.

Materials unit costs were the prevailing costs in Ottawa for a medium volume builder. The estimated cost of the vinyl-covered plywood supplied by the manufacturer assumed that the covering was on one side only. Although these panels were delivered with vinyl on both sides, the original plan was to have only one side faced. The panels faced with vinyl on both sides would be replaced at a later date with the single-faced panels to obtain a realistic field evaluation of these panels.

It was also planned to cover the nailheads in the vinyl-faced panels with a vinyl filler, but this was not supplied at the time the cost study was made. In addition, it was intended to use battens and trim covered with the same materials, but these were not supplied.

RESULTS

Labour times for the various operations were determined by recording activities at 1-minute intervals. Labour and material costs are listed in Tables II and VI. A summary of unit costs for the various sidings is shown in Table VII. Since carpenter labour was used in applying the kraft paper, the wage rate for carpenters was used in establishing the unit cost for this operation. The unit price for vinyl-covered plywood was estimated by the manufacturer. The material used in this case is not generally available on the Canadian market, and its application to the plywood was made in a factory. It is therefore difficult to predict the final selling price of this product should it become generally available to the building industry. This should be kept in mind in comparing the costs of the various sidings.

DISCUSSION

On the basis of the labour and material costs in Table I, the cost in place of the painted kraft-covered panels and vinyl-covered panels is about the same, even though the labour cost per square foot to apply the vinyl panels was considerably higher than for the kraft-covered panels. Part of the reason for this was that about 53 per cent of the labour time involved in applying the vinyl-covered plywood was idle time as compared with 25 per cent in the case of kraft-covered plywood. If one compares the relative costs per square foot of the two sidings exclusive of plywood cost or panel installation, the painted kraft paper is \$0.01 more than the estimated cost of the vinyl. The cheapest finishes of all are the painted finishes, which are only \$0.07 per sq ft when check-resisting primer is used and \$0.06 per sq ft when latex primer is used. It should be remembered that the labour measured in replacing the sidings may not be representative of the labour that would be measured in a series of houses, where the tradesmen have developed a routine of work.

In a previous cost study on the NHBA Mark V house, for example, a considerable increase in labour was noted over that of a regular project house, because the Mark V house was not one of a series, and incorporated changes from the tradesmen's usual practice.

One must also consider other aspects than cost alone. Appearance and maintenance must also be considered. The finish that provided the best appearance and would probably require the least maintenance was the vinyl-covered type. The kraft paper siding, while costing nearly the same as the vinyl per square foot, did not provide as satisfactory an appearance. The glue bond was not continuous; after a period of wet weather these unbonded areas expanded, and gave the appearance of blisters over the wall surface. The performance history of the original kraft paper siding suggests that this blistering is likely to increase.

Table I

UNIT COSTS

Unit labour costs	Unit material costs
Carpenters - \$3.60 per hour	3/8-in. sanded Douglas-fir plywood - \$0.20/sq ft
Painters - \$3.00 per hour	Vinyl facing (one side only) factory-applied- \$0.15/sq ft*
	Check-resisting primer- \$7.36/gal
	Latex primer- \$5.15/gal
	Latex finish- \$5.94/gal
	Kraft paper- \$0.75/100 sq ft
	Waterproof adhesive- \$8.00/gal*
	1-in. by 2-in. pine strapping- \$0.065/lin ft
	2-in. galvanized nails- \$0.20/lb

*

estimated by manufacturer

Table II

COST OF PLYWOOD SIDING WITH CHECK-RESISTING PRIMER AND
TWO COATS OF LATEX

Operation	Total costs		Unit costs (per sq ft)		
	Labour	Material	Labour	Material	Total
Install panels	\$22.24	\$42.37	\$0.1058	\$0.2015	\$0.3073
Prime coat (Check-resistant)	2.55	3.68	0.0126	0.0174	0.0300
Second coat (Latex)	2.97	1.58	0.0141	0.0075	0.0216
Third coat (Latex)	1.98	1.76	0.0094	0.0084	0.0178
Totals	29.74	49.39	0.1419	0.2348	0.3767

Table III

COST OF PLYWOOD SIDING WITH THREE COATS OF LATEX PAINT

Operation	Total costs		Unit costs (per sq ft)		
	Labour	Material	Labour	Material	Total
Install panels	\$18.14	\$34.57	\$0.1058	\$0.2015	\$0.3073
Prime coat (Latex)	2.75	1.39	0.0160	0.0081	0.0241
Second coat (Latex)	2.43	1.28	0.0141	0.0075	0.0216
Third coat (Latex)	1.62	1.44	0.0094	0.0084	0.0178
Totals	24.94	38.68	0.1453	0.2255	0.3708

Table IV

COST OF PLYWOOD COVERED WITH KRAFT PAPER AND
THREE COATS OF PAINT

Operation	Total costs		Unit costs (per sq ft)		
	Labour	Material	Labour	Material	Total
Apply kraft to plywood	\$29.16	\$ 12.75	\$0.0711	\$0.0311	\$0.1022
Install panels	28.44	82.75	0.0694	0.2018	0.2712
Prime coat (latex)	4.10	3.24	0.0100	0.0079	0.0179
Second coat (latex)	5.10	2.80	0.0124	0.0068	0.0192
Third coat (latex)	5.00	3.55	0.0122	0.0086	0.0208
Totals	71.80	105.09	0.1751	0.2562	0.4313

Table V

COST OF VINYL-COVERED PLYWOOD

Operation	Total cost		Unit costs (per sq ft)		
	Labour	Materials	Labour	Materials	Total
Install panels	\$64.20	\$185.84	\$0.1221	\$0.3534	\$0.4755

Table VI

COST OF INSTALLING BATTENS AND TRIM

Operation	Total cost		Unit cost (per linear ft)		
	Labour	Materials	Labour	Materials	Total
Install battens and trim*	\$91.14	\$59.08	\$0.0961	\$0.0623	\$0.1584
Prime ** coat	13.95	3.45	0.0168	0.0041	0.0209
Second coat	7.80	1.19	0.0094	0.0014	0.0108
Third * coat	6.50	1.31	0.0069	0.0014	0.0083
Totals	119.39	65.03	0.1192	0.0692	0.1884

* - Includes 121 ft of metal "Z" trim

** - 330 ft of batten primed with check resisting primer
500 ft of batten primed with latex primer

Table VII

SUMMARY OF TOTAL UNIT COSTS

Type of siding	Total cost per sq ft	
	Including plywood cost and panel installation	Not including plywood cost or panel installation
3/8-in. plywood with check-resist- ing primer and two coats latex	\$0.38	\$0.07
3/8-in. plywood with three coats latex	\$0.37	\$0.06
3/8-in plywood with kraft paper and three coats latex	\$0.43	\$0.16
3/8-in. plywood with sheet vinyl	\$0.48	\$0.15