

TEST TYPE:	UL 580 – CONSTRUCTION No: 589
TESTING AUTHORITY:	UNDERWRITERS LABORATORIES
TEST NAME:	WIND UPLIFT
TEST DATE:	
TEST COMPLETED BY:	GREG REZEK
TESTING LABORATORY	UNDERWRITERS LABORATORIES
PANEL TYPE:	1 1/2 IN SNAP LOCK W/ CLIP
PANEL WIDTH:	16 1/2
CLIP SPACING:	36" OC
DECKING CONSTRUCTION:	5/8 INCH PLYWOOD

**OBJECT:** THE OBJECT OF THIS INVESTIGATION WAS THE CLASSIFICATION, FOR UPLIFT PURPOSES, OF THE PANEL IDENTIFIED ABOVE. THE CLASSIFICATION IS TO BE AUTHORIZED FOR ANY MANUFACTURER WHO PURCHASES A ROLLFORMER CAPABLE OF FORMING THE ABOVE PROFILES, FROM SCHLEBACH, INC. AND REQUESTS CLASSIFICATION.

THE OBJECT OF THIS INVESTIGATION WAS TO DEVELOP TEST DATA WITH RESPECT TO THE UPLIFT RESISTANCE, PER UL 580, OF ROOF DECK CONSTRUCTIONS UTILIZING THE SPECIFIC METAL ROOF DECK PANELS AND ROOF DECK FASTENERS (PANEL CLIPS) WHERE USED, IDENTIFIED ABOVE. THIS DEVELOPED DATA CAN BE USED AS A BASIS FOR THE PROMULGATION OF CLASSIFICATION UPON SUBSEQUENT SUBMITTAL BY VARIOUS MANUFACTURERS THAT DEMONSTRATE THEIR ABILITY TO PRODUCE THE SAME PRODUCT (S).

THE SAID MANUFACTURER WILL HAVE PURCHASED ROLLFORMING EQUIPMENT FROM YOUR COMPANY, SCHLEBACH INC WHICH IS IDENTICAL TO THE EQUIPMENT WHICH WAS USED TO MANUFACTURE THE PANELS WHICH ARE DESCRIBED IN THIS REPORT.

AT THE TEST SPONSOR'S REQUEST AFTER THE UL 580 TEST WAS COMPLETED FOR EACH ASSEMBLY THE ASSEMBLY WAS TESTED IN ACCORDANCE WITH THE UL 1897 STANDARD.

#### **DESCRIPTION OF MATERIALS**

THE MATERIALS USED FOR THE WOOD DECK AND SUPPORTS TOGETHER WITH THE FASTENERS WERE AS FOLLOWS.

**PERIPHERAL SUPPORTS** – THE SUPPORTS USED AT THE PERIPHERY OF THE TEST ASSEMBLIES WERE 2 IN BY 10 IN LUMBER NO.2 GRADE.

**WOOD JOISTS** – THE JOISTS WERE 2 INCH BY 10 INCH, NO. 2 GRADE LUMBER.

**JOIST HANGERS** – THE HANGERS USED AT THE ENDS OF THE JOISTS FOR SUPPORT AND ATTACHMENT TO THE PERIPHERAL SUPPORTS WERE SEAT TYPE. FABRICATED FROM NO. 18 MSG COATED STEEL.

**FASTENERS (SCREWS)** THE FASTENERS USED TO ATTACH THE PERIPHERAL SUPPORTS TO THE TEST FRAME WERE 5/8 INCH MACHINE BOLTS. FASTENERS USED TO ATTACHÉ THE JOIST HANGERS TO THE PERIPHERAL SUPPORTS AND THE JOIST HANGERS WERE COARSE THREAD, NO. 2 PHILLIPS DRIVE BUGLE HEAD, STEEL SCREWS 2 1/2 INCH LONG. FASTENERS USED TO ATTACH THE PLYWOOD DECKING TO THE JOISTS AND PERIPHERAL SUPPORTS WERE THE SAME TYPE AS THOSE USED FOR THE JOIST HANGERS.

**ROOFING FELT** – THE FELT USED OVER THE PLYWOOD DECK WAS A 30LB TYPE.

## **TEST ASSEMBLY**

**METAL ROOF DECK PANELS** – THE PANELS USED IN THE TEST ASSEMBLY WERE 16 1/2 IN. WIDE AND 1 1/2 IN. HIGH (38 MM) AT THE FEMALE RIB. THEY WERE FABRICATED FROM NO. 24 MSG COATED STEEL. THE PANEL IS IDENTIFIED AS “1 1/2 IN. SNAP SEAM” BY THE TEST SPONSOR.

**ROOF DECK FASTENERS (PANEL CLIPS)** – THE PANEL CLIPS USED AT THE SIDES OF THE PANELS FOR ATTACHMENT OF THE PANELS TO THE PLYWOOD DECKING WERE A ONE PIECE ASSEMBLY. THE CLIP BASE WAS 3 3/4 IN. LONG AND 1 1/2 IN. WIDE AND HAD AN OPPOSING LEG 7/8 IN. LONG AND 1 1/4 IN. WIDE. THE UPPER SEGMENT WAS 1 1/2 IN. HIGH, 3 1/2 IN. LONG WITH A 1/2 IN. RETURN. THE CLIP WAS FABRICATED FROM NO. 18 MSG COATED STEEL. THE CLIPS ARE DESIGNATED AS “SNAP SEAM CLIP” BY THE TEST SPONSOR.

**FASTENERS (SCREWS)** – THE FASTENERS USED TO ATTACH THE PANEL CLIPS TO THE PLYWOOD DECKING WERE NO. 10-12 BY 1 IN. LONG, NO. 2 PHILLIPS DRIVE, WAFER-HEAD PLATED STEEL SCREWS. FASTENERS USED AT THE PERIPHERY OF THE ASSEMBLY WERE THE SAME TYPE.

## **CONSTRUCTION OF TEST ASSEMBLIES:**

THE ROOF DECK ASSEMBLIES WERE CONSTRUCTED IN THE TEST FRAME IN ACCORDANCE WITH THE METHODS INDICATED BY THE SUBMITTER.

THE WOOD DECK SUB-ASSEMBLIES WERE CONSTRUCTED IN THE SAME MANNER, FOR ALL THREE CONSTRUCTIONS, AS FOLLOWS:

THE 2 IN. BY 10 IN. PERIPHERAL SUPPORTS WERE LOCATED ADJACENT TO THE WALLS OF THE TEST FRAME AND FASTENED TO THEM USING 5/8 IN. MACHINE BOLTS DRIVEN THROUGH THE LUMBER INTO MACHINE NUTS WELDED TO THE STEEL FRAME. THE SUPPORTS FORMED A CONTINUOUS SHELF AROUND THE TEST FRAME. THE JOIST HANGERS WERE INSTALLED AT A SPACING OF .24 IN. OC. USING THE NO. 8 BY 1 1/2 IN. COARSE THREAD SCREWS DRIVEN INTO THE PERIPHERAL SUPPORTS. THE JOISTS WERE THEN SLIPPED INTO THE JOIST HANGERS AND FASTENED TO THEM USING THE NO. 8 SCREWS WITH THREE SCREWS USED ON EACH SIDE OF EACH JOIST.

THE PLYWOOD DECK WAS INSTALLED IN THE ASSEMBLY USING THE NO. 8 BY 2 1/2 IN. LONG COARSE THREAD SCREWS DRIVEN INTO THE JOISTS WITH THE SCREWS SPACED 6 IN. OC. AT THE BUTT ENDS AND 12 IN. OC. IN THE FIELD. THE DECKING WAS ATTACHED TO THE PERIPHERAL SUPPORTS USING THE NO. 8 SCREWS SPACED 6 IN. OC. THROUGHOUT. ALL JOINTS WERE THEN SEALED WITH A ONE PART SEALANT FEATHERED OUT FROM THE JOINT. A LAYER OF FELT WAS PLACED OVER THE PLYWOOD DECK AND FASTENED TO IT USING STAPLES IN A RANDOM SPACING. A LAYER OF PLASTIC SHEETING WAS THEN PLACED OVER THE FELT.

### **INSTALLATION OF ROOF DECK PANELS**

A FULL LENGTH PANEL CUT TO A WIDTH OF APPROXIMATELY 3 IN. AND WITH THE MALE RIB INTACT WAS PLACED IN THE ASSEMBLY ADJACENT TO THE SOUTH WALL OF THE TEST FRAME. PANEL CLIPS WERE SLIPPED OVER THE MALE RIB OF THE PANEL AT A SPACING OF 36 IN. OC. AND FASTENED TO THE PLYWOOD DECK USING TWO NO. 10-12 WAFER-HEAD SCREWS FOR EACH CLIP. A FULL WIDTH PANEL, 10 FT. LONG WAS PLACED IN THE ASSEMBLY ADJACENT TO THE FIRST PANEL WITH THE FEMALE RIB SNAPPED OVER THE MALE RIB OF THE FIRST PANEL AND INCLUDING THE UPPER TAB OF THE PANEL CLIPS. THE PANEL CLIPS WERE FASTENED TO THE PLYWOOD DECK IN THE SAME MANNER AS FOR THE FIRST PANEL. A TOTAL OF SIX MORE FULL WIDTH, 10 FT. LONG PANELS WERE INSTALLED IN THE ASSEMBLY IN THE SAME MANNER AS USED FOR THE FIRST PANEL SECTION. A FINAL SECTION OF PANEL, 10 FT. LONG AND CUT TO A WIDTH OF APPROXIMATELY 8 IN. WITH THE FEMALE RIB INTACT WAS INSTALLED IN THE ASSEMBLY WITH THE RIB SNAPPED OVER THE MALE RIB OF THE PREVIOUS PANEL. THE PANELS WERE THEN FASTENED AT THEIR PERIPHERY WITH THE FASTENERS SPACED 6 IN. OC. AT THE NORTH AND SOUTH WALLS AND WITH FOUR FASTENERS USED AT THE PANEL ENDS.

### **TEST RECORD GENERAL**

#### **UPLIFT TESTS:**

THE UPLIFT TESTS WERE CONDUCTED IN ACCORDANCE WITH THE STANDARD UL580 ENTITLED "TESTS FOR UPLIFT RESISTANCE OF ROOF ASSEMBLIES".

## METHOD

THE STANDARD TEST EQUIPMENT OF UNDERWRITERS LABORATORIES, INC. FOR ROOF DECK CONSTRUCTIONS WAS USED FOR EACH UPLIFT TEST.

FOUR DEFLECTION TARGETS WERE MOUNTED ON TOP OF THE CENTRAL PANEL FOR EACH ASSEMBLY; AT THE PANEL MID-SPAN (ONE BETWEEN THE RIBS AND ONE OVER A RIB), AND AT THE PANEL QUARTER SPAN (ONE BETWEEN THE RIBS AND ONE OVER A RIB).

THROUGHOUT EAS TEST, OBSERVATIONS WERE MADE OF THE CONTROL OF POSITIVE AND NEGATIVE PRESSURES AND OF THE BEHAVIOR OF THE TOP AND UNDER SURFACES OF THE ASSEMBLY.

## RESULTS

GENERAL NOTES—THE ACTION OF THE ROOF DECKS UPON APPLICATION OF THE STEADY PRESSURES (PHASES I, II, IV, AND V) WAS UPWARD BOWING BETWEEN POINTS OF ATTACHMENT WITH THE PURLINS FOLLOWING THE SAME PATTERN.

THE ACTION OF THE JOISTS AND PANELS DURING THE OSCILLATING PERIOD OF THE TESTS (PHASE III) WAS A RISING AND SETTING OF THE MEMBERS. THE DEGREE TO WHICH THE MEMBERS DEFLECTED DURING EACH PHASE CAN BE DETERMINED FROM THE READINGS PRECEDING THE SPECIFIC TEST NOTES. ALL DIMENSIONS CITED IN THE SPECIFIC TEST NOTES ARE APPROXIMATE.

### "1 1/2 IN. SNAP SEAM"

#### 30 LB/FT<sup>2</sup> UPLIFT

DEFLECTION IN INCHES -

TARGET LOCATIONS				
PHASE	1/4 SPAN PANEL <u>OVER</u> <u>RIBS</u>	MID-SPAN PANEL <u>OVER</u> <u>RIB</u>	1/4 SPAN PANEL <u>BETWEEN</u> <u>RIBS</u>	MID-SPAN PANEL <u>BETWEEN</u> <u>RIBS</u>
I	0.08	0.07	0.09	0.08
II	0.18	0.20	0.15	0.23
III				
MINIMUM	0.18	0.20	0.15	0.22
MAXIMUM	0.23	0.27	0.20	0.28
IV	0.02	0.02	0.04	0.05
V	0.11	0.16	0.10	0.21

#### SPECIFIC TEST OBSERVATIONS

PHASE I - THE PANELS ARE WRINKLED VERY SLIGHTLY BETWEEN THE RIBS.

**PHASE II** – THE WRINKLING IN THE PANELS HAVE INCREASED VERY SLIGHTLY. THERE ARE NO CHANGES OBSERVED IN THE SUB-BACK INCLUDING THE PLYWOOD AND THE WOOD JOISTS.

**PHASE III** – THE PANELS ARE MOVING VERY SLIGHTLY AT PRESSURE CHANGES. THE WOOD JOISTS APPEAR TO BE MOVING VERY SLIGHTLY ALSO. AT 50 MIN., NO CHANGES ARE OBSERVED IN THE CONDITION OR ACTION OF THE ASSEMBLY FROM THE PREVIOUS PHASE III OBSERVATIONS. AT THE END OF THE PHASE III, THE ASSEMBLY HAS RETURNED TO PRE-TEST CONDITIONS WITH SOME WRINKLING PRESENT IN THE FLAT AREAS OF THE PANELS BETWEEN THE RIBS.

**PHASE IV** – THE WRINKLES IN THE FLAT AREAS OF THE PANELS ARE ABOUT THE SAME AS OBSERVED DURING PHASE III MAXIMUM PRESSURE. THE EXPOSED EDGES OF THE RIB ARE OPENED SLIGHTLY MORE THAN PRIOR TO THE START OF THE FIRE TEST.

**PHASE V** – THE WRINKLES IN THE PANELS ARE MORE NOTICEABLE. THE JOISTS ARE BOWING SLIGHTLY. THE EXPOSED EDGE OF THE RIBS IS OPENED SLIGHTLY MORE THAN OBSERVED DURING PHASE IV OR PHASE III, MAXIMUM PRESSURE.

**POST TEST** – AT THE END OF THE CLASS 30 TEST, THE ASSEMBLY HAS RETURNED ABOUT TO PRETEST CONDITIONS WITH THE WRINKLING SLIGHTLY MORE NOTICEABLE THAN PRIOR TO THE START OF THE CLASS 30 TEST.

**60 LB/FT<sup>2</sup> UPLIFT**  
**DEFLECTION IN INCHES –**

<b>TARGET LOCATIONS</b>				
<b>PHASE</b>	<b>¼ SPAN PANEL OVER RIBS</b>	<b>MID-SPAN PANEL OVER RIB</b>	<b>¼ SPAN PANEL BETWEEN RIBS</b>	<b>MID-SPAN PANEL BETWEEN RIBS</b>
I	0.12	0.17	0.14	0.13
II	0.17	0.36	0.31	0.37
III				
MINIMUM	0.32	0.40	0.33	0.38
MAXIMUM	0.43	0.52	0.44	0.53
IV	0.23	0.29	0.21	0.26
V	0.40	0.50	0.45	0.52

**SPECIFIC TEST CONDITIONS**

**PHASE I** – THE PANEL BOWING IS ABOUT THE SAME AS OBSERVED DURING PHASE IV CLASS 30.

**PHASE II** – THE PANEL BOWING HAS INCREASED BETWEEN THE RIBS. THE RIBS ARE ALSO BOWING SLIGHTLY. THE EXPOSED EDGE OF THE RIBS ARE OPENED MORE THAN OBSERVED DURING PHASE I. ON THE UNDERSURFACE, THE PLYWOOD AND JOISTS ARE ABOUT THE SAME AS AT PRE-TEST. ALL FASTENERS AND PANEL CLIPS ARE HOLDING.

**PHASE III** – AT 20 MIN., THE ASSEMBLY IS IN A BREATHING MOTION WITH MOVEMENT AT PRESSURE CHANGES GRATER THAN OBSERVED DURING PHASE III CLASS 30. THE WRINKLES IN THE FLAT AREAS OF THE PANELS ARE MORE DEFINED AND APPEAR TO CHANGE VERY SLIGHTLY AT PRESSURE CHANGES. THE RIBS ARE VERTICAL WITH NO ROTATION PRESENT. THE EXPOSED EDGES OF THE RIBS ARE OPENED MORE THAN OBSERVED DURING PHASE II AND THERE IS LITTLE CHANGE IN WIDTH AT PRESSURE CHANGES. THE MAXIMUM OPENING AT THE EXPOSED EDGE IS AT THE CENTRAL AREA OF THE ASSEMBLY. AT 50 MIN., THERE ARE NOT CHANGES OBSERVED IN THE CONDITION OR ACTION OF THE ASSEMBLY FROM THE PREVIOUS PHASE III OBSERVATIONS. AT THE END OF PHASE III, THE ASSEMBLY HAS RETURNED ABOUT TO PRE-TEST CONDITIONS WITH THE WRINKLING IN THE FLAT AREAS OF THE PANELS SLIGHTLY MORE NOTICEABLE.

**PHASE IV** – THE ASSEMBLY IS IN ABOUT THE SAME CONDITION AS OBSERVED DURING PHASE II.

**PHASE V** – THE PANEL BOWING HAS INCREASED FROM THAT OBSERVED DURING PHASE IV AND IS ABOUT THE SAME AS OBSERVED DURING PHASE III MAXIMUM PRESSURE. THE EXPOSED EDGES OF THE RIBS ARE OPENED ABOUT THE SAME ASS THE PHASE ALSO ON THE UNDERSURFACE, THE JOISTS ARE BOWED ABOUT THE SAME AS OBSERVED DURING PHASE III MAXIMUM PRESSURE. THIS BOWING IS SLIGHT, HOWEVER, ALL FASTENERS APPEAR TO BE HOLDING.

**POST TEST** – AT THE END OF THE CLASS 60 TEST, THE ASSEMBLY HAS RETURNED ABOUT TO PRE-TEST CONDITIONS WITH THE WRINKLES SLIGHTLY MORE NOTICEABLE THAN PRIOR TO THE START OF THE CLASS 60 TEST.

**90 LB/FT<sup>2</sup> UPLIFT**

DEFLECTION IN INCHES –

<b>TARGET LOCATIONS</b>				
<b>PHASE</b>	<b>¼ SPAN PANEL <u>OVER</u> RIBS</b>	<b>MID-SPAN PANEL <u>OVER</u> RIB</b>	<b>¼ SPAN PANEL <u>BETWEEN</u> RIBS</b>	<b>MID-SPAN PANEL <u>BETWEEN</u> RIBS</b>
I	0.19	0.23	0.24	0.27
II	0.41	0.52	0.83	0.58
III				
MINIMUM	0.37	0.46	0.79	0.51
MAXIMUM	0.43	0.53	0.85	0.61
IV	0.25	0.32	0.51	0.37
V	0.51	0.64	0.96	0.74

**SPECIFIC TEST OBSERVATIONS**

**PHASE I** – THE WRINKLES IN THE PANELS ARE ABOUT THE SAME S OBSERVED DURING PHASE V CLASS 60. THE EXPOSED EDGES OF THE RIBS ARE ALSO ABOUT THE SAME AS PHASE V, CLASS 60. THE RIBS ARE ALSO BOWED LENGTHWISE ABOUT THE SAME AS THAT PHASE.

**PHASE II** – THE ASSEMBLY IS BOWING TO A GREATER EXTENT THAN OBSERVED DURING PHASE I. THE WRINKLES ARE ABOUT THE SAME AS THAT PHASE. THE EXPOSED EDGES OF THE RIBS ARE OPENED MORE THAN OBSERVED DURING PHASE I.

**PHASE III** – AT 45 MIN., THE ASSEMBLY IS IN A BREATHING MOTION WITH THE WRINKLES OBSERVED PREVIOUSLY MORE DEFINED. THE WRINKLES ARE BASICALLY LOCATED TOWARD THE CENTRAL AREA OF THE ASSEMBLY. THE EXPOSED EDGES OF THE RIBS ARE ABOUT THE SAME AS OBSERVED DURING PHASE II. THE RIBS ARE VERTICAL WITH NO ROTATION OBSERVED. THEY ARE ALSO BOWED SLIGHTLY. ON THE UNDERSURFACE, THE WOOD JOISTS ARE MOVING SLIGHTLY AT PRESSURE CHANGES, ABOUT THE SAME AS OBSERVED DURING PHASE III CLASS 60. ALL FASTENERS ARE HOLDING. AT 60 MIN., NO CHANGES ARE OBSERVED IN THE CONDITION OR ACTION OF THE ASSEMBLY FROM THE PREVIOUS PHASE III OBSERVATIONS. THE RIBS ARE BOWING APPROXIMATELY 1 IN. MAXIMUM LENGTHWISE. AT THE END OF PHASE III, THE WRINKLES REMAINING IN THE FLAT AREAS OF THE PANELS ARE SLIGHTLY MORE DEFINED. ALSO, THE EXPOSED EDGES OF THE RIBS ARE OPENED SLIGHTLY MORE. ALL PANEL CLIPS AND SCREW FASTENERS ARE HOLDING.

**PHASE IV** – THE CONDITIONS IN THE ASSEMBLY ARE ABOUT THE SAME AS OBSERVED DURING PHASE III MAXIMUM PRESSURE.

**PHASE V** – THE PANEL BOWING HAS INCREASED FROM THAT OBSERVED DURING PHASE IV WITH THE WRINKLES BETWEEN THE RIBS MORE DEFINED THAN OBSERVED PREVIOUSLY. THE DEEPEST WRINKLING IS TOWARD THE CENTER SPAN OF THE PANEL. THE RIBS ARE ALSO BOWED TO A GREATER EXTENT THAN OBSERVED PREVIOUSLY. THE EXPOSED EDGES OF THE RIBS ARE OPENED MORE THAN OBSERVED DURING PREVIOUS PHASES. ALL PANEL CLIPS AND SCREW FASTENERS APPEAR TO BE HOLDING.

**POST TEST** – AT THE END OF THE CLASS 90 TEST, THE ASSEMBLY HAS RETURNED ABOUT TO PRE-TEST CONDITIONS WITH THE RESIDUAL WRINKLES MORE DEFINED AND MORE NUMEROUS. THE EXPOSED EDGES OF THE RIBS ARE OPENED MORE THAN OBSERVED PRIOR TO THE START OF THE CLASS 90 TEST. THERE IS SLIGHT RESIDUAL BOWING PRESENT IN THE RIBS. THE PLYWOOD FASTENERS, AND PANEL CLIPS AND SCREW FASTENERS ALL APPEAR TO BE HOLDING. THE ASSEMBLY IS CONSIDERED TO HAVE ATTAINED A CLASS 90 UPLIFT RATING.

#### **CONCLUSION:**

THE FOLLOWING CONCLUSIONS REPRESENT THE JUDGMENT OF UNDERWRITERS LABORATORIES, INC., BASED UPON THE RESULTS OF THE EXAMINATION AND TEST PRESENTED IN THIS REPORT AS THEY RELATE TO ESTABLISHED PRINCIPLES AND PREVIOUSLY RECORDED DATA.

#### **UPLIFT RESISTANCE PROPERTIES:**

## **UL580**

IT IS JUDGED THAT THE ROOF DECK ASSEMBLIES, CONSTRUCTED OF THE MATERIALS AND IN THE MANNER HEREIN DESCRIBED WILL AFFORD A CLASS 90 UPLIFT TEST. THREE NEW CONSTRUCTIONS WILL BE DESCRIBED AS THE RESULT OF THIS UPLIFT TEST PROGRAM. THEY ARE IDENTIFIED AS FOLLOWS:

CONSTRUCTION NO. 589 WHICH WILL UTILIZE "1 1/2 IN. SNAP SEAM"  
PANELS

## **UL 1897**

IT IS FURTHER JUDGED THAT THE ROOF DECK ASSEMBLY, CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN TEST ASSEMBLY NO. 3, HAS ATTAINED A 225 PSF UPLIFT RATING. THE MODE OF FAILURE WAS WOOD JOIST FAILURE.

SECONDARY SUPPORTS, (BEAMS, PURLINS, JOISTS, BULB TEES, LATERAL BRACING, ETC.) CONNECTIONS OF THESE ASSEMBLIES TO THE MAIN STRUCTURAL MEMBERS, (GIRDERS, COLUMNS, ETC.) AND CONSTRUCTION DETAILS ALONG THE EDGES OF THE ROOF OR AROUND ROOF OPENING (SKY LIGHT PANELS, MECHANICAL EQUIPMENT, CHIMNEYS, ETC.) HAVE NOT BEEN EVALUATED.

### **PRACTICABILITY:**

THE MATERIALS USED IN THE TEST ASSEMBLIES CAN BE READILY INSTALLED BY QUALIFIED WORKMEN WITH TOOL AND METHODS COMMONLY USED FOR CONSTRUCTION WORK OF A SIMILAR NATURE.

THE MATERIALS AND INSTALLATION PROCEDURES DESCRIBED IN THIS REPORT ARE JUDGED TO BE SIGNIFICANT FACTORS IN THE UPLIFT RESISTANCE OF THE CONSTRUCTIONS.

### **CONFORMITY:**

THE ASSEMBLIES WERE TESTED IN ACCORDANCE WITH THE STANDARD UL 580 ENTITLED "TEST FOR UPLIFT RESISTANCE OF ROOF ASSEMBLIES" AND THE STANDARD UL 1897 ENTITLED "UPLIFT TESTS FOR ROOF COVERINGS SYSTEMS".

### **CLASSIFICATION AND FOLLOW-UP SERVICE:**

THE METAL ROOF DECK PANELS AND PANEL CLIPS, DESCRIBED HEREIN, ARE JUDGED TO BE ELIGIBLE FOR CLASSIFICATION AND FOLLOW-UP SERVICE OF UNDERWRITERS LABORATORIES, INC. UNDER THE SERVICE, A MANUFACTURER WHO IS CAPABLE OF MANUFACTURING ANY OF THE PANELS DESCRIBED HEREIN IS AUTHORIZED TO USE THE LABORATORIES CLASSIFICATION MARKING ON SUCH PRODUCTS WHICH COMPLY WITH THE FOLLOW-UP SERVICE PROCEDURE AND OTHER APPLICABLE REQUIREMENTS OF UNDERWRITERS LABORATORIES, INC. ONLY THOSE PRODUCTS WHICH

PROPERLY BEAR THE LABORATORIES CLASSIFICATION MARKING ARE  
CONSIDERED AS CLASSIFIED BY UNDERWRITERS LABORATORIES, INC.

THE CLASSIFICATION MARKING TO BE USED ON THE METAL ROOF DECK  
PANELS IS ILLUSTRATED BELOW:

**METAL ROOF DECK PANELS  
CLASSIFIED BY  
UNDERWRITERS LABORATORIES INC  
AS TO UPLIFT RESISTANCE ONLY  
CLASS 90  
AS SHOWN BY CONSTRUCTION NO 589**

THE CLASSIFICATION MARKING TO BE USED ON THE PANEL CLIPS IS ILLUSTRATED BELOW:

**ROOF DECK FASTENERS  
CLASSIFIED BY  
UNDERWRITERS LABORATORIES INC  
AS TO UPLIFT RESISTANCE ONLY  
CLASS 90  
AS SHOWN BY CONSTRUCTION NO 589**

**SUMMARY:**

THE ROOF DECK CONSTRUCTIONS SHOWN IN D589 DESCRIBED BELOW WILL SERVE TO SUMMARIZE THE RESULTS OF THE DATA DEVELOPED DURING THIS PRELIMINARY INVESTIGATION. WE HAVE RESERVED CONSTRUCTION NOS. 589 FOR THESE ASSEMBLIES. WHEN THERE ARE CLASSIFIED PANELS AND PANEL CLIPS AVAILABLE FOR THESE ASSEMBLIES. WE WILL ESTABLISH THE ABOVE AND ESTABLISH CLASSIFICATION FOR YOUR PANELS AND PANEL CLIPS.

FILE: NC4291-1, 4,5

GUIDE TGKX  
ROOF DECK CONSTRUCTIONS  
D589-B CARD

DATE:

PART 2 - DESCRIPTION OF NUMBERED ITEMS  
CONSTRUCTION NO. 589

FIRE NOT INVESTIGATED

1. **METAL ROOF DECK PANELS** - NO. 24 MSG THICK COATED STEEL WIDTH 16 IN., RIB HEIGHT 1 1/2 IN. HIGH AT THE FEMALE RIB. PANELS CONTINUOUS OVER THREE OR MORE SPANS WITH NO END LAPS. A BEAD OF SEALANT MAY BE USED AT PANEL RIBS.

**FUTURE CLASSIFIED COMPANY** - PANEL NAME SNAP SEAM PROFILE

2. **ROOF DECK FASTENERS (PANEL CLIPS)** - ONE PIECE ASSEMBLY, 3 3/4 IN. WIDE AT BASE WITH A 3 1/2 IN. WIDE UPPER SEGMENT. THE UPPER SEGMENT HAD A 1/2 IN RETURN. THE BASE HAD AN OPPOSING SEGMENT 7/8 IN. LONG AND 1 1/4 IN. WIDE.

**FUTURE CLASSIFIED COMPANY** – CLIP NAME

3. **PANEL FASTENERS (SCREWS)** – THE FASTENERS USED TO ATTACH THE PANEL CLIPS TO THE PLYWOOD DECK WERE NO. 10-12 BY 1 IN. LONG, NO. 2 PHILLIPS DRIVE, WAFER-HEAD, PLATED STEEL SCREWS. TWO SCREWS USED PER CLIP.
4. **PLYWOOD DECK** – NOMINAL 5/8 IN. (19/32 IN. ACTUAL) PLYWOOD., APA RATED. FASTENED TO SUPPORTS (JOISTS) USING NO. 8 BY 2 1/2 IN. LONG, NO. 2 PHILLIPS DRIVE, COARSE THREAD, BUGLE HEAD STEEL SCREWS. SPACED 6 IN. OC. AT THE BUTT ENDS AND 12 IN. OC. IN THE FIELD. ALL JOINTS TO BE SEALED WITH A ONE PART POLYISOCYANURATE SEALANT FEATHERED OUTWARD FROM THE JOINT.
5. **JOISTS** – GRADED DIMENSIONAL LUMBER, NO. 2 OR BETTER. SPACED 24 IN. OC. MAX.
6. **FELT** – NO. 30 ORGANIC OR GLASS FIBER ROOFING FELT, INSTALLED PER MANUFACTURER'S INSTRUCTIONS.