

<b>TEST TYPE:</b>	<b>UL 580 - CONSTRUCTION NO: 587</b>
<b>TESTING AUTHORITY:</b>	<b>UNDERWRITERS LABORATORIES</b>
<b>TEST NAME:</b>	<b>WIND UPLIFT</b>
<b>TEST DATE:</b>	
<b>TEST COMPLETED BY:</b>	<b>GREG REZEK</b>
<b>TESTING LABORATORY</b>	<b>UNDERWRITERS LABORATORIES</b>
<b>PANEL TYPE:</b>	<b>1 1/2 IN NAIL STRIP SNAP LOCK</b>
<b>PANEL WIDTH:</b>	<b>14 1/2</b>
<b>CLIP SPACING:</b>	<b>18 OC</b>
<b>DECKING CONSTRUCTION:</b>	<b>5/8 INCH PLYWOOD</b>

**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 SPONSORS 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 FOR TESTING APPARATUS**

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.

#### **DESCRIPTION OF MATERIALS FOR ROOF PANELS**

THE METAL ROOF DECK PANELS AND CLIP PANELS WHERE USED IN EACH ASSEMBLY WERE USED AS FOLLOWS:

**METAL ROOF DECK PANELS** – THE PANELS USED IN THE TEST ASSEMBLY WERE 14 1/2 INCH WIDE AND 1 1/2 INCH (38MM) HIGH AT THE RIB. THEY WERE FABRICATED FROM NO.24 MSG COATED STEEL. THE PANEL IS IDENTIFIED AS 1 1/2 INCH NAIL STRIP 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 TWO PART ASSEMBLY CONSISTING OF A BASE AND AN UPPER TAB. THE BASE WAS 5 IN. LONG AND HAD A 3/4 IN. HORIZONTAL LEG AND A 3/4 IN. VERTICAL LEG. THE BASE WAS FABRICATED FROM NO. 18 MSG THICK COATED STEEL. THE UPPER TAB WAS 1-3/4 IN. WIDE AND 1 1/2 IN. HIGH AND WAS FORMED TO FIT OVER THE VERTICAL LEG OF THE BASE AND THE MALE RIB OF THE PANEL. THE UPPER TAB WAS FABRICATED FROM NO. 23 MSG THICK COATED STEEL. THE CLIPS ARE IDENTIFIED AS “STANDING SEAM CLIPS” BY THE TEST SPONSOR.

**FASTENERS (SCREWS)** – THE FASTENERS USED TO ATTACH THE PANEL CLIPS TO THE PLYWOOD DECKING WERE NO. 10-12 BY 1 I. LONG. NO 2 PHILLIPS DRIVE, WAFER-HEAD COATED 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**

### **ASSEMBLY 1**

A FULL LENGTH PANEL CUT TO A WIDTH OF APPROXIMATELY 10 IN. WITH THE MALE RIB INTACT WAS PLACED IN THE ASSEMBLY ADJACENT TO THE SOUTH WALL OF THE TEST FRAME. THE PANEL WAS FASTENED TO THE PLYWOOD DECK USING THE NO. 10-12 PAN CAKE HEAD SCREWS, SPACED 18 IN. OC., DRIVEN THROUGH THE GUIDE HOLES LOCATED NEAR THE MALE RIB. A FULL WIDTH, 10 FT. LONG PANEL WAS PLACED IN THE ASSEMBLY WITH THE FEMALE RIB SNAPPED OVER THE MALE RIB OF THE 10 IN. WIDE PANEL. THE PANEL WAS FASTENED TO THE PLYWOOD DECK USING THE FASTENERS IN THE SAME MANNER AND SPACING AS THE FIRST PANEL. A TOTAL OF SEVEN MORE FULL WIDTH, 10 FT. LONG PANELS WERE INSTALLED IN THE ASSEMBLY IN THE SAME MANNER AS THE FIRST TWO PANELS. A FINAL 10FT. LONG PANEL CUT TO A WIDTH OF APPROXIMATELY 10 IN. WITH THE FEMALE RIB INTACT WAS PLACED IN THE ASSEMBLY AND SNAPPED INTO PLACE. THE PANELS WERE FASTENED AT THE PERIPHERY USING THE NO. 10-12 SCREWS SPACED 12 IN. OC. AT THE NORTH AND SOUTH WALLS AND WITH THREE FASTENERS USED AT EACH PANEL END.

## **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.

### TEST NO. 1 - "1 - 1/2 NAIL STRIP"

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

#### DEFLECTION IN INCHES

<b>TARGET LOCATIONS</b>				
<u>PHASE</u>	<u>PANEL 1/4 SPAN OVER RIB</u>	<u>PANEL CENTER SPAN OVER RIB</u>	<u>PANEL 1/4 SPAN BETWEEN RIBS</u>	<u>PANEL CENTER SPAN BETWEEN RIBS</u>
I	0.10	0.18	0.33	0.46
II	0.22	0.35	0.52	0.74
III				
MINIMUM	0.22	0.34	0.50	0.69
MAXIMUM	0.27	0.41	0.60	0.84
IV	0.23	0.34	0.50	0.71
V	0.36	0.54	0.76	1.02

#### SPECIFIC TEST OBSERVATIONS

**PHASE I** - THE PANELS ARE BOWING BETWEEN THE RIBS TO A HEIGHT OF APPROXIMATELY ONE-HALF THE HEIGHT OF THE RIBS. THE RIBS ARE SPREAD OPEN SLIGHTLY AT THEIR BASES.

**PHASE II** - THE PANEL BOWING BETWEEN THE RIBS IS SLIGHTLY GREATER THAN OBSERVED DURING PHASE I, APPROXIMATELY TWO-THIRDS THE HEIGHT OF THE RIBS IN SOME AREAS. THE RIBS ARE SPREAD OPEN SLIGHTLY MORE AND THEY ARE ROTATING TOWARD THE DIRECTION OF THE MALE SIDE OF THE RIB. THE EXPOSED EDGES OF THE RIBS ARE OPEN ABOUT THE SAME AS PRIOR TO THE START OF THE CLASS 30 TEST.

**PHASE III** - AT 44 MIN, THE ASSEMBLY IS IN A BREATHING MOTION WITH THE PANELS MOVING IN THE AREAS BETWEEN THE RIBS FROM APPROXIMATELY 1/2 TO 5/8 IN. BELOW THE UPPER SURFACE OF THE RIBS. THE RIBS ARE ROTATING MORE THAN OBSERVED DURING PHASE II WITH SLIGHT MOVEMENT AT THE PRESSURE CHANGES. THE EXPOSED JOINT IN THE RIBS IS ABOUT THE SAME AS OBSERVED DURING PHASE II WITH LITTLE CHANGE AT PRESSURE CHANGES. ALL FASTENERS APPEAR TO BE HOLDING. ON THE UNDERSURFACE, THE JOISTS ARE BOWING SLIGHTLY WITH SLIGHT MOVEMENT OBSERVED AT PRESSURE CHANGES. THE PLYWOOD IS TIGHT AGAINST THE UPPER SURFACE OF THE JOISTS. AT THE

END OF PHASE III, THE ASSEMBLY HAS RETURNED ABOUT TO PRETEST CONDITIONS WITH THE AREAS BETWEEN THE RIBS RAISED SLIGHTLY. ALSO, THE RIBS APPEAR TO BE SPREAD OPEN SLIGHTLY AT THEIR BASES WITH SOME ROTATION PRESENT.

**PHASE IV** - THE BOWING IN THE ASSEMBLY IS ABOUT THE SAME AS OBSERVED DURING PHASE III MAXIMUM PRESSURE. THE ROTATION OF THE RIBS IS ABOUT THE SAME AS AT THE PHASE.

**PHASE V** - THE PANEL BOWING HAS INCREASED FROM THAT OBSERVED DURING PHASE I AND IS ALSO SLIGHTLY GREATER THAN OBSERVED DURING PHASE V, CLASS 30. THE ROTATION OF THE RIBS IS ALSO SLIGHTLY GREATER WITH THE EXPOSED JOINT IN THE RIBS APPEARING TO BE OPEN MORE. THERE ARE NO SIGNS OF DISHED AREAS OR WRINKLES PRESENT IN THE PANELS. ON THE UNDERSURFACE, THE WOOD JOISTS ARE BOWING ABOUT THE SAME AS OBSERVED DURING PHASE V, CLASS 30. THE PLYWOOD APPEARS TO BE TIGHT AGAINST THE UPPER SURFACE OF THE JOISTS. AT 61 MIN, THE ASSEMBLY IS IN A BREATHING MOTION WITH NO 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 PRETEST CONDITIONS WITH THE RESIDUAL BOWING SLIGHTLY GREATER AND WITH THE EXPOSED JOINT OPENED SLIGHTLY MORE. THE ROTATION OF THE RIBS IS ABOUT THE SAME AS PRIOR TO THE START OF THE CLASS 60 TEST.

**PHASE IV** - THE PANELS ARE BOWING TO A GREATER EXTENT THAN OBSERVED DURING PHASE III, MAXIMUM PRESSURE WITH THE RIBS ALSO ROTATED SLIGHTLY MORE. THE EXPOSED JOINTS ARE OPENED ABOUT THE SAME AS PHASE III, MAXIMUM PRESSURE. ON THE UNDERSURFACE, THE PLYWOOD IS TIGHT AGAINST THE UPPER SURFACE OF THE WOOD JOISTS. THE JOISTS ARE BOWING SLIGHTLY.

**PHASE V** - THE PANEL BOWING IS GREATER THAN OBSERVED DURING PHASE IV OR PHASE III, MAXIMUM PRESSURE. THE RIBS ARE ROTATED TO A GREATER EXTENT THAN THAT PHASE. THE EXPOSED EDGE OF THE PANELS ARE THE MALE SIDE IS SLIGHTLY WIDER. ON THE UNDERSURFACE, THE JOISTS ARE BOWING TO A GREATER EXTENT THAN OBSERVED PREVIOUSLY. THE PLYWOOD APPEARS TO BE TIGHT AGAINST THE UPPER SURFACE OF THE JOISTS WITH ALL FASTENER HOLDING.

**POST TEST** - AT THE END OF THE CLASS 60 TEST, THE ASSEMBLY HAS RETURNED ABOUT TO PRETEST CONDITIONS WITH THE RESIDUAL BOWING SLIGHTLY GREATER. ALSO, THE JOINTS AT THE MALE SIDE OF THE RIBS APPEAR TO BE SLIGHTLY WIDER. THE ROTATION OF THE RIBS IS ABOUT THE SAME AS PRIOR TO THE START OF THE CLASS 60 TEST. ON THE UNDERSURFACE, THE JOISTS HAVE RETURNED TO PRE-TEST CONDITIONS. THE PLYWOOD APPEARS TO BE TIGHT AGAINST THE UPPER SURFACE OF THE JOISTS.

**90 LB/FT<sup>2</sup> UPLIFT****DEFLECTION IN INCHES -**

<b>TARGET LOCATIONS</b>				
<b>PHASE</b>	<b>PANEL 1/4 SPAN <u>OVER</u> <u>RIB</u></b>	<b>PANEL CENTER <u>SPAN OVER</u> <u>RIB</u></b>	<b>PANEL 1/4 SPAN <u>BETWEEN</u> <u>RIBS</u></b>	<b>PANEL CENTER SPAN <u>BETWEEN</u> <u>RIBS</u></b>
I	0.24	0.37	0.75	1.02
II	0.50	0.70	1.10	1.45
III				
MINIMUM	0.44	0.60	1.03	1.34
MAXIMUM	0.53	0.70	1.10	1.45
IV	0.34	0.50	0.87	1.19
V	0.61	0.83	1.23	1.64

**SPECIFIC TEST OBSERVATIONS - PHASE I -** THE PANELS ARE BOWING BETWEEN THE RIBS APPROXIMATELY THE SAME AS OBSERVED DURING PHASE IV, CLASS 60.

**PHASE II -** THE PANELS ARE BOWING TO A GREATER EXTENT THAN OBSERVED DURING PHASE V, CLASS 60 WITH ROTATION IN THE RIBS ALSO GREATER. THE EXPOSED JOINTS IN THE MALE SIDE OF THE RIBS ARE OPEN SLIGHTLY MORE THAN THAT PHASE.

**PHASE III -** AT 17 MIN. THE ASSEMBLY IS IN A BREATHING MOTION WITH THE MAGNITUDE OF BOWING AND MOVEMENT GREATER THAN OBSERVED DURING PHASE III, CLASS 60. THE RIBS ARE ALSO ROTATED TO A GREATER EXTENT THAN THAT PHASE WITH SLIGHT CHANGE IN POSITION AT PRESSURE CHANGES OBSERVED. THE EXPOSED JOINTS AT THE MALE SIDES OF THE RIBS ARE OPEN TO A GREATER EXTENT WITH LITTLE CHANGES IN WIDTH OBSERVED AT PRESSURE CHANGES. ON THE UNDERSURFACE, THE JOISTS ARE BOWED AND THE MOVEMENT IS ABOUT THE SAME AS OBSERVED DURING PHASE III, CLASS 60. THE PLYWOOD IS TIGHT AGAINST THE UPPER SURFACE OF THE JOISTS. ALL FASTENERS APPEAR TO BE HOLDING. AT 56 MIN. NO CHANGES ARE 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 PRETEST CONDITIONS WITH SOME RESIDUAL BOWING PRESENT. ALSO, THE ROTATION OF THE RIBS APPEARS TO BE ABOUT THE SAME AS PRIOR TO THE START OF THE CLASS 90 TEST. THE EXPOSED JOINT, APPEAR TO BE SLIGHTLY WIDER THAN PRIOR TO THE START OF THE CLASS 90 TEST. ON THE UNDERSURFACE, THE PLYWOOD IS TIGHT AGAINST THE UPPER SURFACE OF THE JOISTS. ALL FASTENERS APPEAR TO BE HOLDING. THE JOISTS HAVE RETURNED TO PRE-TEST CONDITIONS.

**PHASE IV -** THE PANEL BOWING IS ABOUT THE SAME AS OBSERVED DURING PHASE III MAXIMUM PRESSURE. THE RIBS ARE ALSO ROTATING TO THE SAME DEGREE AS THAT PHASE. ALSO, THE EXPOSED JOINTS AT THE MALE SIDE OF THE RIBS ARE ABOUT THE SAME AS PHASE III. ON THE UNDERSURFACE, THE JOISTS ARE BOWING ABOUT THE SAME AS PHASE III, MAXIMUM PRESSURE.

**PHASE V -** THE PANEL BOWING HAS INCREASED FROM THE OBSERVED DURING PHASE IV AND IS GREATER THAN OBSERVED DURING PHASE III, MAXIMUM

PRESSURE. THE RIBS ARE ALSO ROTATING TO A GREATER EXTENT. THE EXPOSED JOINTS AT THE MALE SIDE OF THE RIBS ARE OPEN ABOUT THE SAME AS OBSERVED PREVIOUSLY. THE JOISTS ARE BOWING TO A GREATER EXTENT THAN OBSERVED DURING PHASE III, MAXIMUM PRESSURE. THE PLYWOOD IS TIGHT AGAINST THE UPPER SURFACE OF THE JOISTS.

**POST TEST** - AT THE END OF THE CLASS 90 TEST, THE ASSEMBLY HAS RETURNED ABOUT TO PRETEST CONDITIONS WITH THE RESIDUAL BOWING SLIGHTLY GREATER THAN AT THE START OF THE CLASS 90 TEST. THE EXPOSED JOINTS IN THE PANEL RIBS ARE OPENED SLIGHTLY WIDER THAN PRIOR TO THE START OF THE CLASS 90 TEST. OTHER CONDITIONS ARE ABOUT THE SAME AS PRIOR TO THE START OF THE CLASS 90 TEST.

### **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. 587 WHICH WILL UTILIZE "1 1/2 IN. NAIL STRIP" 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., HAS ATTAINED A 130 PSF UPLIFT RATING. THE MODE OF FAILURE WAS PANEL PULLOVER OF A SCREW FASTENER.

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 587**

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 587**

**SUMMARY:**

THE ROOF DECK CONSTRUCTIONS SHOWN IN D587 DESCRIBED BELOW WILL SERVE TO SUMMARIZE THE RESULTS OF THE DATA DEVELOPED DURING THIS PRELIMINARY INVESTIGATION. WE HAVE RESERVED CONSTRUCTION NOS. 587 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 NC 4291-1,-4,5  
GUIDE TGKX  
ROOF DECK CONSTRUCTIONS

DATE  
D587-B CARD

**PART 2 - DESCRIPTION OF NUMBERED ITEMS  
CONSTRUCTION No. 587**

FIRE NOT INVESTIGATED



1. **METAL ROOF DECK PANELS** \*- NO. 24 MSG THICK COATED STEEL, WIDTH 14 1/2 , RIB HEIGHT 1 1/2 IN. PANELS CONTINUOUS OVER THREE OR MORE CLIPS WITH NO END LAPS. A BEAD OF SEALANT MAY BE USED AT RIBS.

**FUTURE CLASSIFIED COMPANY** – PANEL NAME STANDING SEAM PROFILE

2. **PANEL FASTENER (SCREWS)** – FASTENERS USED TO ATTACH THE PANELS TO THE PLYWOOD TO BE NO. 10-12 BY 1 IN. LONG. NO. 2 PHILLIPS DRIVE, PANCAKE HEAD, PLATED STEEL WOOD SCREWS. SPACING TO BE 18 IN. OC.
3. **PLYWOOD DECK** – NORMAL 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 URETHANE SEALANT AND FEATHERED OUT FROM THE JOINT.
4. **JOISTS** – GRADED DIMENSIONAL LUMBER, NO. 2 OR BETTER. SPACED 24 IN. OC. MAX.
5. **JOIST HANGERS** – NO. 18 MSG COATED STEEL, OPEN SEAT TYPE.

**ROOFING FELT** – NO. 30 ORGANIC OR GLASS FIBER ROOFING FELT INSTALLED PER MANUFACTURER'S INSTRUCTIONS.