

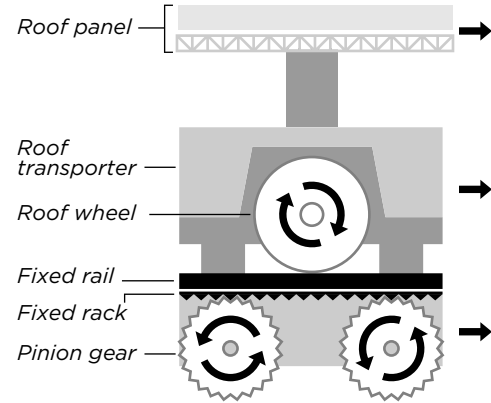
COWBOYS STADIUM

They've got it covered: How the roof works

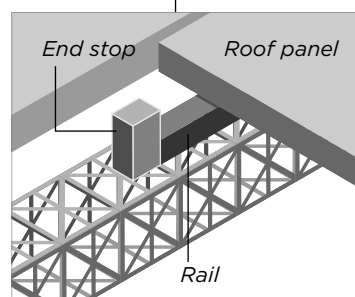
The computer-controlled roof at Cowboys Stadium is one of the few of its kind in the National Football League. It uses 128 small motors to open and close the two giant roof panels, creating an opening reminiscent of the one at Texas Stadium.

How the roof panels move

Motors at the sides of each roof panel rotate pinion gears that engage a fixed rack. As the gears turn, the roof transporter moves back and forth along the rail.



Note: Elements in diagram are not proportionally scaled.

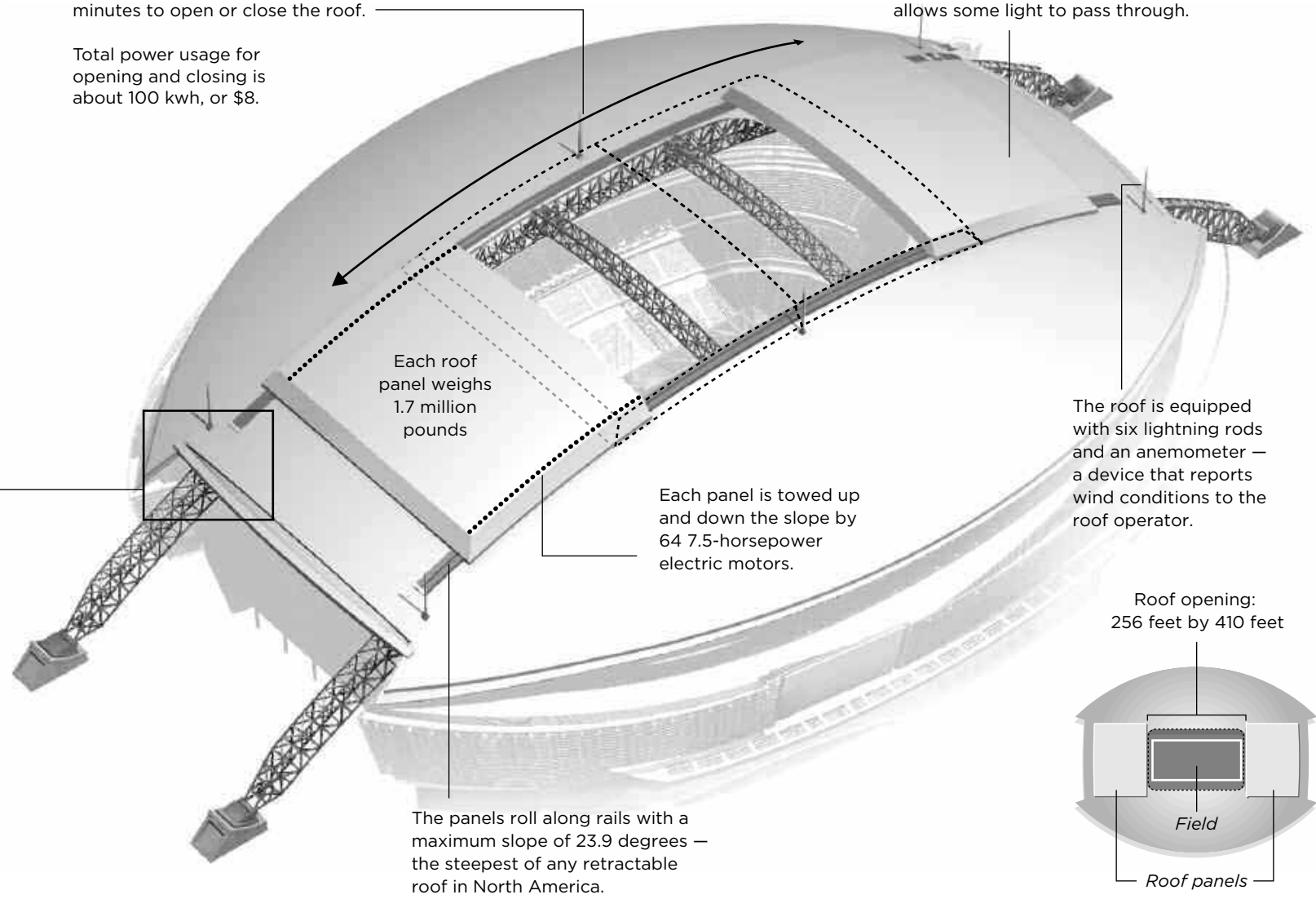


As an added safety precaution, end stops prevent the panels from rolling off the rails.

The travel distance for each panel is 215 feet. It takes about nine minutes to open or close the roof.

Total power usage for opening and closing is about 100 kwh, or \$8.

The roof is covered with Teflon-coated fabric. The material is water- and stain-resistant and allows some light to pass through.



Selected retractable roofs in the U.S.



Chase Field
Location: Phoenix
Year completed: 1998
Architects: Ellerbe Becket
Engineers: Martin/Martin Consulting Engineers



Safeco Field
Location: Seattle
Year completed: 1999
Architects: NBBJ
Engineers: Magnusson Klemencic Associates



Minute Maid Park
Location: Houston
Year completed: 2000
Architects: HOK Sport
Engineers: Walter P. Moore



Miller Park
Location: Milwaukee
Year completed: 2001
Architects: HKS Inc., NBBJ, Eppstein Uhen
Engineers: Ove Arup & Partners



Reliant Stadium
Location: Houston
Year completed: 2002
Architects: HOK Sport
Engineers: Walter P. Moore



University of Phoenix Stadium
Location: Glendale, Ariz.
Year completed: 2006
Architects: Peter Eisenman, HOK Sport
Engineers: Walter P. Moore



Lucas Oil Stadium
Location: Indianapolis
Year completed: 2008
Architects: HKS Inc.
Engineers: Walter P. Moore

SOURCES: Walter P. Moore; Uni-Systems; HKS Inc.; Microsoft Virtual Earth; Dallas Morning News research

TROY OXFORD/Staff Artist; KEVIN HAND/Special Contributor



TOM FOX/Staff Photographer

Cowboys Stadium in Arlington features a retractable roof that measures 661,000 square feet, making it the largest of its kind in the world.

AT A GLANCE Scheduled events at stadium

Confirmed events at Cowboys Stadium in Arlington:

June 6: George Strait, Reba McEntire, Blake Shelton and Julianne Hough

June 20: Jonas Brothers, Jordin Sparks and Honor Society

July 19: CONCACAF Gold Cup soccer quarterfinal

July 26: World Football Challenge: Chelsea FC vs. Club America

Aug. 21: Cowboys vs. Tennessee Titans (preseason), 7 p.m.

Aug. 29: Cowboys vs. San Francisco 49ers (preseason), 7 p.m.

Sept. 5: Oklahoma vs. Brigham Young University football (five-year contract with ESPN to host a college football game on Labor Day weekend)

Sept. 7: 2009 Kirk Herbstreit Varsity Football Series:

Eules Trinity vs. Bingham (South Jordan, Utah), noon
 Houston Klein Oak vs. Notre Dame Prep (Sherman Oaks, Calif.), 2:30 p.m.
 Colleyville Heritage vs. Irving MacArthur, 5 p.m.
 Mansfield Timberview vs. Mansfield Summit, 7:30 p.m.

Sept. 20: Cowboys vs. New York Giants, 7:15 p.m.

Sept. 28: Cowboys vs. Carolina Panthers, 7:30 p.m.

Oct. 3: Texas A&M vs. Arkansas football (10-year contract with options of up to 20 more years)

Oct. 12: U2

Oct. 25: Cowboys vs. Atlanta Falcons, 3:15 p.m.

Nov. 1: Cowboys vs. Seattle Seahawks, noon

Nov. 22: Cowboys vs. Washington Redskins, noon

Nov. 26: Cowboys vs. Oakland

Raiders, 3:15 p.m.

Nov. 28: Baylor vs. Texas Tech football

Dec. 5: Big 12 football championship

Dec. 13: Cowboys vs. San Diego Chargers, 3:15 p.m.

Dec. 19: Texas vs. North Carolina basketball

Jan. 2, 2010: AT&T Cotton Bowl Classic (10-year contract with options of up to 25 more years)

Jan. 3, 2010: Cowboys vs. Philadelphia Eagles, noon

Feb. 14, 2010: NBA All-Star game

Dec. 4, 2010: Big 12 football championship

Feb. 6, 2011: Super Bowl XLV

Oct. 5, 2013: Notre Dame vs. Arizona State football

April 5 and 7, 2014: NCAA men's Final Four