Iowa: a tilt-up state

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**Why is Tilt-Up Growing?**

- Economics
- Large Panels
- On-Site
- Simple Forming
- Reduced Structure

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### Conventional Construction

<table>
<thead>
<tr>
<th>Activity</th>
<th>Quantity</th>
<th>UM</th>
<th>Unit Cost</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>Brick Veneer</td>
<td>39,318</td>
<td>sf</td>
<td>17.00</td>
<td>668,406</td>
</tr>
<tr>
<td>Glue Perimeter Bays (Interior Bays are Unchanged)</td>
<td>646,800</td>
<td>lb</td>
<td>0.75</td>
<td>485,100</td>
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<tr>
<td>Grount Perimeter Columns</td>
<td>1,142</td>
<td>lf</td>
<td>8.50</td>
<td>9,707</td>
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<tr>
<td>Plywood at Parapet</td>
<td>1,999</td>
<td>sf</td>
<td>2.25</td>
<td>4,498</td>
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<td>Sheet Metal Coping</td>
<td>615</td>
<td>lf</td>
<td>15.00</td>
<td>9,225</td>
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<tr>
<td>10&quot; Exterior Stud Walls</td>
<td>39,318</td>
<td>sf</td>
<td>7.90</td>
<td>310,612</td>
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<td>Parapet Framing</td>
<td>615</td>
<td>lf</td>
<td>7.00</td>
<td>4,305</td>
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<tr>
<td>EIFS at Parapet</td>
<td>1,230</td>
<td>sf</td>
<td>8.00</td>
<td>9,840</td>
</tr>
</tbody>
</table>

**Total Amount** $1,692,223
History and Background

The Rich History of Craftsmanship
What is Tilt-Up?

A construction method which eliminates the cumbersome practice of constructing two wood walls to get one concrete wall.

-Thomas A Edison, 1909

Modern Definition: The process of casting walls or other concrete elements on site, lifting and placing them in their final location in a structure.

History of Tilt-Up
History of Tilt-Up

Evolution of Tilt-Up | 1946
Evolution of Tilt-Up | Today

Broader Geographic Distribution
Tilt-Up Market Growth Across the Globe
Evolution of Tilt-Up

Ground Release Hardware

Concrete Admixtures
Evolution of Tilt-Up Laser Screed

Concrete Finishing
New Products/Technologies

- IECC Requirements
  - Energy Efficiency
  - Thermal Mass
  - Structurally Composite
  - Natural Air-BARRIERS
  - Insulation Continuity
  - Variable Glazing %

New Products/Technologies

- ASCE/TCA Requirements
  - Bracing Complexities
  - Multi-story Floor Interference
  - Higher wind capacity
  - Quality of floor slab
  - Timing of structural design
New Ideas & Thinking

- Storm Resistance
- Permanence of Structure
- Efficiency of Materials
- Sustainability
- “Cradle to Grave”
- Security
- Safe Shelter
- Emergency Management

Stretching the Envelope
Tilt-Up: The Sustainable Solution

- Built Entirely On Job Sites
- Local Materials/Equipment
  - Ready-Mix
  - Aggregate
  - Cranes
- Efficiency of Materials
  - Reduced Structure
  - Recycling

Tilt-Up – A Time-lapse
Control of Trades = Control of Schedule

Greater Market Penetration

The conceivable and perceivable matrix of building and program types has surpassed all expectations for the use of on-site, precast panels and structural shapes.
Finding Tilt-Up Potential

The Built Landscape of Iowa

Simple Façade: Common Warehouse
Simple Panels?
Apple Controlled Atmosphere Building, Wanatchee, Washington

Big Boxes
Google Data Center Complex
Council Bluffs, IA

Facebook Data Center
Altoona, IA
Biggest Big Boxes

4,130,698 square feet
Daikin Industries,
Houston, TX

Shopping Malls/Centers

Jordan Creek Town Center, West Des Moines, IA
Shopping Malls/Centers

Umhlung Rocks Gateway
Theater of Shopping,
South Africa
3,470,000 SF

Spiritual Centers

Lutheran Church of Hope, West Des Moines, IA
Spiritual Centers
Our Lady of Guadalupe Catholic Church
Doral, Florida

Showrooms
DitchWitch of Minnesota & Iowa, Huxley, IA
Showrooms

Overhead Door of Bountiful, UT

Construction Headquarters

Henkel Construction Company | Accord Architecture
Ames, IA
Construction Headquarters
Hogan Office Building,
Centerville, Utah
Business Parks
High Field Business Park
Building #3, Engelwood, Colorado

School Districts
Perry High School
Perry, IA
School Districts

High Point Academy Charter School
Aurora, Colorado

Public Schools

Dixie Middle School,
St. George, Utah
Dealerships

Zimmerman Alfa Romeo & FIAT, Davenport, IA

Dealerships

Seminole Harley Davidson
Sanford, Florida
Dealerships
Mercedes Benz, Fort Lauderdale, Florida

Life-Style Malls
Prairie Trail Concept Rendering, Ankeny, IA
Life-Style Malls

Canton Crossing
Baltimore, MD

Design Covenant Business Parks

Glen Office Building, Woodbridge, VA
Thank You

Tilt-Up Concrete Association

The mission of the Tilt-Up Concrete Association is to expand and improve the use of tilt-up as the preferred building system by providing education and resources that enhance quality and performance.

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Thin Brick Panels
Zenith Ridge, Canonsburg, Pennsylvania
Trompe L’œil
Multiusuarios – San Luis Potosi, Mex

Panels with Large Openings
Westway Plaza, Houston, Texas
Spandrel Effect
West Centre, Houston, Texas

Panels with Relief
Scottsdale Community College, Cloud Song Center – Scottsdale, Arizona
Exposed Aggregate
Midwest Commercial, Salt Lake City, Utah

Mixed Materials
Blackbaud
Charleston, South Carolina
Industrial
Lycon’s Aggregate Storage Building and Batch Plant, Janesville, Wisconsin

Theatres
Warren Theatre, Broken Arrow, Oklahoma
Recreation  
FUI Wellness, Miami, Florida

Museums  
Saint Louis Art Museum, New East Building  
Saint Louis, Missouri
Civic Buildings

Erie Police Station, Erie, Colorado

Playful Forms

Chapel of St. Ignatius Church, Seattle, Washington
University Classrooms
Walker Hall, Maryville University
Saint Louis, Missouri

Medical Offices
Riverfront Medical Center,
St George, Utah
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Tall Panels
(111’-9”)

Florida International University Dormitory, North Miami, Florida
Overlapping Panels

Prologis Stapleton Business Center Building 1, Denver Colorado

Historical Reproduction

Bishop Gadsden Church, Charleston, South Carolina
Curved Walls

Marathon Petroleum Corporation Central Control Building, Texas City, Texas

Curved Panels

Centro Internacional de Negocios, Juarez, MEX
Curved Panels

Kingdom Builders
Community Center, Texas

Sloping Panels

Ventana Medical Systems, Inc., Oro Valley, AZ
Trompe L’oieL

Thunderbird Fire Protection, Phoenix, AZ

Republic National Distributing Company, La Vista, Nebraska

Free Form Panels
Angular Panels

Thatcher Chemical, Las Vegas, Nevada

Spandrel Effect

Inova Dry Creek, Centennial, Colorado
Spandrel Effect

Penn, Dallas, Texas

Form Liners

Clyde Corporate Offices, Oren, Utah
Texture

Jost Chemical, Bel-Ridge, Missouri

Stamping

Pattern-Crete, Inc. Office/Warehouse, Villa Park, Illinois
Staining
Ak-Chin Entertainment Complex, Maricopa, Arizona

Stacked Panels
Legacy at Fallbrook, Houston, Texas
Mixed Materials

Access Dental, Sacramento, California

Whimsical

Martins Royal Office, Kennesaw, GA
Florida Power & Light
Brickell Substation
Miami, FL

Unusual Shapes

Lynn University Snyder Sanctuary, Boca Raton, Florida

What Were They Smoking?
Applications of Tilt-Up

Distribution/Warehouse

Prologis Stapleton Business Center 3, Denver, Colorado
Office Building

Eagle Burgmann, Houston, Texas

Office Buildings

Westway Plaza, Houston, Texas
Triton Ballpark and Marye Anne Fox Clubhouse, La Jolla, California

Recreation

Rich Products Distribution Center, Houston, Texas

Food Industry
Food Industry

Beans, Meats, & Soups, Saginaw, Texas

Beverage Industry

Avery Brewing Company, Boulder, Colorado
Museums
Miami Children’s Museum, Miami, FL

Public Schools

Galaxy Elementary School, Boynton Beach, Florida
Civic Buildings
Los Banos Courthouse, Los Banos, California

Religious Buildings
West Springs Church, Baldwin, Missouri
Dormitories
FAU Innovation Village Apartments, Boca Raton, Florida

Performing Arts
Seawalk Performance Pavilion, Jacksonville, FL
Emerus Community Hospital, Tomball, Texas

Lone Tree Medical Center
Correctional Facilities

Mendota Federal Correction Facility, California

Parking Garage

JTA Kings Avenue Parking Garage, Florida
Prototype Housing, Aman, Jordan

Row Houses on F, San Diego, California

Homes

Multi-Family
Casinos
Sibaya Casino, Durban, South Africa

Entertainment
Double Dee Ranch and Salon, West Palm Beach, FL
Monuments

Korean War Veterans Memorial, Kansas City

What’s Next?
What’s Next?
Challenge Yourself!!!

Surprise Us!!!
King Shaka International Airport Entrance