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2018 ROCKY MOUNTAIN REGIONAL CONFERENCE
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PLATINUM

GOLD

SILVER
Design Excellence in Design Build
• Introductions
• What is Design Excellence?
• Busting the Myths
• Case Studies
• Best Practices
• Q & A
Greg Holroyd, DBIA
• Director of Mechanical Services Hensel Phelps

Greg Gidez – DBIA, AIA
• Director of Design Services Hensel Phelps
What is Design Excellence?

It depends who you ask
What is Design Excellence?

According to the Architect....
The Architect

• “As architects, our clients expect 100% design excellence, no matter what the scale or the budget of the project. This is achievable because scale and budget do not determine architectural design excellence. Design Excellence requires a complex balance of the pragmatic and the poetic”

• AIA.org Website
What is Design Excellence?

According to the Engineer....
ACEC Engineering Excellence Award

RATING GUIDELINES

Entries will be judged using the following rating guidelines:

- Uniqueness and/or Innovative Applications of New or Existing Techniques
- Future Value to the Engineering Profession and Perception by the Public
- Social, Economic, and Sustainable Development Considerations
- Complexity
- Successful Fulfillment of Client/Owner Needs.
What is Design Excellence?

According to the Design Builder....
Design Builder’s Perspective

• Criteria compliant
• Constructible
• Aesthetic
• Clear, concise, timely documentation
• Efficient, sustainable
• Warrantable
• Prideful
• Profitable
What is Design Excellence?

According to the Specialty Subcontractor....
Subcontractor Perspective

- Efficient use of materials
- Ease of installation
- Performance of systems
- Clear, concise, timely documentation
- Warrantable
- Commissionable
- Other
What is Design Excellence?

According to the user.....
Users Perspective

• Fit for function
• Comfort
• Aesthetics
• Economics
• Maintainability
• Operational costs
• Other
What is Design Excellence?

According to the Owner....
Owner Perspective

• Fit for function
• Fulfills the vision
• On budget, on time
• Aesthetics and/or performance
• Quality
• Operational costs
• Ease of process
• Other
Busting the Myths

- Architects and Engineers
- Design Builders
- Owners
Myth

• Architects and Engineers are not responsive to budgets and schedules, are late with deliverables, and can be difficult to work with

  o Who picked your partner?
  o Do you have a teaming agreement?
  o Have you put the right people on the Project?
  o Are they educated in DB Best Practices?
  o Are you educated in DB Best Practices?
  o Do you understand the iterative nature of design?
  o Have you communicated the budget and the schedule to the design team?
  o Have you supported the design process?
  o Do you understand the Owners vision?
  o Have you made the mental shift?
Myth

• Design Builders do not respect design and try to suppress design excellence in order to maximize profits
  o Who picked your partner?
  o Do you have a teaming agreement?
  o Have you put the right people on the Project?
  o Are they educated in DB Best Practices?
  o As a Team have you defined goals and expectations?
  o Do you understand the Owners vision?
  o Do you understand the schedule and the budget?
  o Can you make commitments?
  o Have you made the mental shift?
Myth

• Design Builders are only focused on profitability without concern for design, quality or scope. They don’t represent the best interests of the project

  o Who picked your partner?
  o What was your motivation for selecting DB delivery?
  o What was your selection process?
  o Have you put the right people on the Project?
  o Are they educated in DB Best Practices?
  o Are you an engaged participant or an observer?
  o Have you communicated the Owners vision?
  o Do you make timely, informed and sticky decisions
  o Do you understand the transfer of risk?
  o Have you made the mental shift?
California Department of Education

“High performance, indoor environmental quality and sustainability are of paramount importance to the State”

- 110 sustainable strategies
- Commissioning of IAQ
- Displacement ventilation
- Exceeded Title 24 energy by over 40%
- Improved employee productivity
- LEED Gold at opening
- LEED Platinum after 1st year energy performance
- Set State standards for sustainability.
- Delivered 10 months early
- Repeat Client

- Hensel Phelps – Design Builder
- Fentress Architects with Dreyfuss & Blackford Architects
- Critchfield Mechanical DB
- Rosendin Electric DB
- Royal Glass DB
- Schuff Steel DB
UC Irvine Gateway Humanities Building

“The Building shall have a Janus Face, and a sense of unforeseen possibilities”

Design-Builder: Hensel Phelps Construction Co.
Owner: University of California, Irvine
Architect: Fentress Architects
Engineers: Critchfield Mechanical (Mechanical)
Konsortum 1 (Electrical)
M.A. Engineers, Inc. (Plumbing)
Crosby Group (Structural)
PBS&J (Civil)
Specialty Contractors: Critchfield Mechanical, Inc. (Mechanical)
D/K Mechanical (Plumbing)
Anderson & Howard (Electrical)
UC Irvine Gateway Humanities Building

“The Building shall have a Janus Face”
“A sense of Unforeseen Possibilities...”
University of California, Irvine (UCI) Humanities Gateway Awards

- DBIA Western Pacific Region - Merit Award - Best Project, Public Sector Building over $15 million
- Cornerstone Concrete Excellence Award for Concrete Buildings/Institutional Sector
- DBIA National Design-Build Award - Public Sector $25-50 million
“The Project is part of the GSA Design Excellence Program, and should advocate for quality in the Federal built environment. Considerations are given to the First Impressions, Interior Design, Urban Development, and Sustainability initiatives”
## The Team

<table>
<thead>
<tr>
<th>Role</th>
<th>Entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client/Owner:</td>
<td>General Services Administration (GSA)</td>
</tr>
<tr>
<td>Design-Build Team:</td>
<td></td>
</tr>
<tr>
<td>Design-Builder:</td>
<td>Hensel Phelps</td>
</tr>
<tr>
<td>General Contractor:</td>
<td>Hensel Phelps</td>
</tr>
<tr>
<td>Architects:</td>
<td>Genster (Architect of Record)</td>
</tr>
<tr>
<td></td>
<td>Krueck + Sexton (Lead Designer + Bridging Architect/Engineer)</td>
</tr>
<tr>
<td>Engineers:</td>
<td>Syska Hennessy Group, Inc. (MEP &amp; Fire Protection Engineer)</td>
</tr>
<tr>
<td></td>
<td>Walter P Moore (Structural Engineer)</td>
</tr>
<tr>
<td></td>
<td>Rolf Jensen &amp; Associates</td>
</tr>
<tr>
<td></td>
<td>Atkins</td>
</tr>
<tr>
<td>Specialty Contractors</td>
<td>M.C. Dean, Inc. (Electrical Subcontractor)</td>
</tr>
<tr>
<td></td>
<td>John J. Kirlin, Inc.</td>
</tr>
<tr>
<td></td>
<td>Enclos Corp.</td>
</tr>
<tr>
<td>Specialty Consultants</td>
<td>Gordon H. Smith Corporation</td>
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<tr>
<td></td>
<td>Hinman Consulting Engineers, Inc.</td>
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<tr>
<td>Duration of Construction:</td>
<td>25 months</td>
</tr>
<tr>
<td>Actual Project Cost:</td>
<td>$157,200,728</td>
</tr>
</tbody>
</table>
AWARDS

- 2015 Best Overall Design-Build Project of the Year, DBIA Florida Chapter
- 2016 ABC East Coast Chapter Excellence in Construction - Eagle Award
- 2015 GSA Project Management Award
- 2015 DBIA Florida Region - Best Overall in the Federal, State, County, and Municipal Category
- 2015 Federal Project of the Year
- Divine Detail Honor Award
- ENR 2015 Best of the Best Project
- 2016 Alliant Build America Award
- 2015 CMAA Project Achievement Award
AWARDS

- 2016 ABC East Coast Chapter Excellence in Construction - Project of the Year
- ENR Southeast's 2015 Best Project Awards
- 2015 DBIA National Excellence in Process
- 2015 DBIA National Project of the Year
- 2015 DBIA National Award of Excellence
- 2015 DBIA Florida Region - Project of the Year Award (Federal, State, County and Municipal)
- 2015 DBIA National Excellence in Architecture Design Award
- 2015 DBIA National Award of Merit in Federal, County, State, Municipal category
- 2015 DBIA Florida Region - Best Overall Design-Build Project of the Year Award
Project Team

- Fentress Architects
- Critchfield Mechanical – D/B Mechanical
- Rosendin Electric – D/B Electrical
- Hensel Phelps – Design/Builder
Project Goals

• Energy Efficiency
• LEED Certification
• Open well lite concourse
• Work within fixed budget
• Hard and fast schedule
• Operate airport in middle of construction site.
Traditional Overhead Mechanical Design
Displacement Ventilation Approach
Original Cylinder Displacement Device
Custom Air Chair Displacement Device
Project Outcome

• Displacement ventilation design reduced energy 16% from traditional overhead VAV system.
• Custom design/built enhanced air diffusion device.
• Created Spanish Paseos feel in concourse
• Project received LEED Silver Certification.
• Project delivered on budget and on schedule.
San Jose Airport TAIP Awards

- PCI Design Award for Best Parking Structure
- IDEAS National Award
- Engineering Excellence Merit Award
- 2011 Category II Award of Merit
- IDEAS2
- Excellence Award - Transportation
- Constructor Award - Excellence in Project Management
- Excellence Award
- Best of 2010 - Transportation
- Best of 2010 - Overall Top Project
- ACEC 2011 Engineering Excellence - Platinum Award
- AIA Citation Award
- Les Grube Memorial Design Award
- Best of the Best National Award
- Merit Award
- Design-Build Excellence Award
The Pentagon Renovation

Project Team

- Shalom Baranes Associates Architects
- Southland Industries – D/B Mechanical
- M.C. Dean – D/B Electrical
- Hensel Phelps – Design/Builder
Wedge 1

- D/B/B procurement
- Overhead VAV distribution
- Low ceilings
W 2-5 Pentagon Project Goals

• Present Innovative Mechanical Strategy
• Work Within Overall Project Budget
• Demonstrate flexibility for future tenant space modifications.
• Contribute to Sustainable Design Efforts
  - Indoor Air Quality (IAQ)
  - Minimize waste
• Meet Energy and Life Cycle Criteria
• Higher ceilings
The FPIU Concept
The Universal Space Plan
### Life Cycle Cost

<table>
<thead>
<tr>
<th>PAYBACK SUMMARY</th>
<th>BASE CASE</th>
<th>Option A</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRST COST</td>
<td>$25,918,786</td>
<td>$21,183,682</td>
</tr>
<tr>
<td>ESTIMATED INCENTIVES</td>
<td>$0</td>
<td>$0</td>
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<tr>
<td>NET FIRST COST</td>
<td>$25,918,786</td>
<td>$21,183,682</td>
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<tr>
<td>ANNUAL UTILITY SAVINGS</td>
<td>N/A</td>
<td>$139,467</td>
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<tr>
<td>ANNUAL OPER./MAINT. SAVINGS</td>
<td>N/A</td>
<td>($59,857)</td>
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<tr>
<td>TOTAL ANNUAL SAVINGS ($)</td>
<td>N/A</td>
<td>$79,610</td>
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<tr>
<td>TOTAL ANNUAL SAVINGS (%)</td>
<td>N/A</td>
<td>2.56%</td>
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<tr>
<td>SIMPLE PAYBACK (YRS)</td>
<td>N/A</td>
<td>N/A</td>
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</table>

<table>
<thead>
<tr>
<th>CASH FLOW SUMMARY</th>
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<tbody>
<tr>
<td>20 YR CUMULATIVE CASH FLOW</td>
<td>$124,725,352</td>
<td>$114,255,572</td>
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<tr>
<td>20 YR NET CASH FLOW SAVINGS ($)</td>
<td>N/A</td>
<td>$10,469,780</td>
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<tr>
<td>20 YR NET CASH FLOW SAVINGS (%)</td>
<td>N/A</td>
<td>8.39%</td>
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</table>

<table>
<thead>
<tr>
<th>LIFE CYCLE COST SUMMARY (PRESENT VALUES)</th>
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<tbody>
<tr>
<td>20 YR PV OF TOTAL LIFE CYCLE COSTS</td>
<td>$50,900,487</td>
<td>$46,483,049</td>
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<tr>
<td>LIFE CYCLE COST NET SAVINGS ($)</td>
<td>N/A</td>
<td>$4,417,438</td>
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<tr>
<td>LIFE CYCLE COST NET SAVINGS (%)</td>
<td>N/A</td>
<td>8.68%</td>
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</table>

<table>
<thead>
<tr>
<th>FINANCIAL SUMMARY</th>
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<tr>
<td>ADJUSTED INTERNAL RATE OF RETURN</td>
<td>N/A</td>
<td>N/A</td>
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</table>

<table>
<thead>
<tr>
<th>BOTTOM-LINE SUMMARY</th>
<th>BASE CASE</th>
<th>Option A</th>
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</thead>
<tbody>
<tr>
<td>ANNUAL DEBT SERVICE 20 YEARS</td>
<td>$2,352,296</td>
<td>$1,922,555</td>
</tr>
<tr>
<td>FIRST YEAR SAVINGS</td>
<td>N/A</td>
<td>$79,610</td>
</tr>
<tr>
<td>SIMPLE PAYBACK</td>
<td>N/A</td>
<td>N/A *</td>
</tr>
<tr>
<td>20 YR POSITIVE CASH FLOW (CASHFLOW SAVINGS)</td>
<td>N/A</td>
<td>$10,469,780</td>
</tr>
<tr>
<td>NET PRESENT VALUE (20 YR LIFE CYCLE COST)</td>
<td>$50,900,487</td>
<td>$46,483,049</td>
</tr>
</tbody>
</table>

* Since this option is a lower first cost and saves energy compared to the base case, simple payback does not apply.
Project Outcome

• Innovative FPIU mechanical system reduced ceiling space requirements and allowed higher ceilings.
• Smaller DOAS ducts reduced SCIF expense.
• Smaller AHU’s increased usable square footage.
• Improved energy performance compared to Wedge 1.
SSA National Support Center

Project Team

- Corgan/SOM Architects
- Southland Industries – D/B Mechanical
- M.C. Dean – D/B Electrical
- Hensel Phelps – Design/Builder
Project Goals

• Energy efficient design
• LEED Certified
• Tier III Data Center
• Expandable data center capacity (6MW to 10MW).
• GSA Design Excellence
White Space Gallery
IT Containment Strategy
Hot Isle Containment
Heat Recovery System
# Life Cycle Cost

<table>
<thead>
<tr>
<th>Cost</th>
<th>System A - Indirect Evaporative Cooling (IEC)</th>
<th>System B - Fan Array Air Handling Units (AHU’s)</th>
<th>System C - Closed Loop Rejection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation Costs</td>
<td>$19,073,804</td>
<td>$17,321,219</td>
<td>$18,593,487</td>
</tr>
<tr>
<td>Annual Maintenance Costs</td>
<td>$170,000</td>
<td>$152,000</td>
<td>$145,000</td>
</tr>
<tr>
<td>Annual HVAC Water Consumption Costs</td>
<td>$203,709</td>
<td>$118,716</td>
<td>$0</td>
</tr>
<tr>
<td>Annual Energy Costs</td>
<td>$5,641,043</td>
<td>$5,351,290</td>
<td>$5,460,871</td>
</tr>
<tr>
<td>Total Present Worth LCC From BLCC</td>
<td>$119,932,557</td>
<td>$112,143,927</td>
<td>$112,581,517</td>
</tr>
<tr>
<td>Additional Life Cycle Costs</td>
<td>$7,788,630</td>
<td></td>
<td>$437,590</td>
</tr>
</tbody>
</table>
Project Outcomes

• Achieved GSA Design Excellence Award in 2016.
• First data center in GSA inventory to achieve LEED Gold.
• Innovative heat recovery system negated need for nature gas to site.
Social Security Administration National Support Center (SSA NSC)

• 2015 Washington Contractor Awards, Best Sustainable Project
• 2015 Design-Build Project Award
• 2014 Excellence in Construction, Merit
• 2015 Excellence in Construction Award
• 2015 National Award of Merit
• 2015 Alliant Build America Merit Award
• Washington Contractor Awards, 2015 BIM Project - New Construction
University of California, Irvine (UCI) Mesa Court Student Housing Expansion
University of California, Irvine (UCI) Mesa Court Student Housing Expansion

Hensel Phelps
Design Builder

Hartford Engineering  Mechanical Plumbing Engineer

Alpha Mechanical Inc.  Design-Build Subcontractor  Mechanical Plumbing

KHR Associates  Structural Engineer

University of California Irvine  Client

Helix Electric, Inc.  Design-Build Subcontractor  Electrical

Mithun Partners, Inc.  Architect

Michael Wall Engineering  Electrical Engineer
University of California, Irvine (UCI) Mesa Court Student Housing Expansion Awards

- DBIA-National Awards of Merit - Educational Facilities 2017
- DBIA-WPR The Design Excellence Award 2017
- ENR California Regional Best Projects 2017
- DBIA-WPR Regional Award 2017
- DBIA-National Awards of Excellence - Educational Facilities 2017
- DBIA-National Project of the Year 2017
- AIA Seattle Honor Awards for Washington Architecture - Award of Merit 2017
Recent National DBIA Design Excellence Award Winners
I-485/I-85 Turbine Interchange
Excellence in Design (Engineering)
National Award of Excellence, Transportation
National Award of Merit, Transportation

Client/Owner:
North Carolina Department of Transportation

Design-Build:
The Lane Construction Corporation

General Contractor:
The Lane Construction Corporation

Engineer:
STV Incorporated

Specialty Consultants:
RK&K
ECS Carolinas

Other Key Professionals:
SEPI Engineering
Progressive Design Group
Telics
2016

SR-520 Evergreen Point Floating Bridge and Landings Design-Build Project
Excellence in Design (Engineering)
National Award of Merit, Transportation

Client/Owner
Washington State Department of Transportation

Design-Builder
Kiewit/General/Manson, A Joint Venture

General Contractor
Kiewit/General/Manson, A Joint Venture

Architect
Helix Design Group

Engineers
KPFF Consulting Engineers
BergerABAM

Specialty Consultants
International Bridge Technologies
Wood Harbinger

EnviroIssues
Parametrix
Parsons Brinkerhoff
2017

University of Chicago Campus North Residential Commons
Excellence in Design (Architecture)
National Award of Merit, Educational Facilities

Client/Owner
The University of Chicago

Design-Builder
Mortenson Construction/Studio Gang Architects

General Contractor
Mortenson Construction

Architect
Studio Gang Architects

Engineer
dbHMS
Design Excellence is a TEAM sport

- Right people in the right seats
- One vision, one goal
- Game plan
- Leadership
- Commitment
- A well-informed process
- TRUST
Design Excellence Best Practices

• Choose your partners wisely
• Clearly express vision for the project
• Clear on what constitutes Design Excellence
• Collaborative and Integrated Team, including the Owner
• Commitment, with an eye on the goal
• Metric for success
• Celebration and recognition
Q & A