



• August 15-18, 2010 • Dallas, Texas •
• Dallas Convention Center •



Case Studies in New Construction
Fort Carson – The Mountain Post
Clay Benson, Mortenson Construction

Agenda

- LEED Certified New Construction at Ft. Carson
- BCT-H Complex – 12 Buildings
- Wilderness Road Complex – 13 Buildings
- Lessons Learned
- Future Opportunities

Ft. Carson Aerial View

BCT-H Complex Aerial View

Ft. Carson BCT-H COF and TEMF Project Site

- 160 Acres
- Multiple Contractors Involved
- Overlot Grading by PCL/Blueline
- Road Realignment and Utilities by Torix
- COF and TEMF Buildings by Mortenson
- Hardstand and POV Parking by Bryan



Company Operations & Tactical Equipment Maintenance Facilities - Fort Carson, Colorado



GovEnergy 2010

Company Operations Facilities

- Mortenson – LAD - PBS&J Design Build Team
- Six Buildings - 392,000 Square Feet
- LEED Silver
- 18 Month Design & Build Schedule
- 32 Companies; Over 3,800 Soldiers Total
- Buildings House Administrative Operations and Provide Storage for Soldier Supplies and Equipment

BCT-H COF Design Strategies

- Exceed ASHRAE Standard 30 Percent or Greater – Use of Energy Model
- Super Insulate Building
- Reduce Water Usage
- Windows Must Meet AT/FP Requirements
- White TPO Roof

BCT-H COF LEED Scorecard

- SS Credit 1 – Site Selection
- SS Credit 2 – Development Density
- SS Credit 3 – Brownfield Redevelopment
- SS Credit 4.1 – Public Transportation
- SS Credit 4.2 – Bike Storage & Showers
- SS Credit 4.3 – Preferred Parking
- SS Credit 4.4 – Parking Capacity
- SS Credit 5.1 – Restore Habitat

BCT-H COF LEED Scorecard

- SS Credit 7.2 – Heat Island Roof
- WE Credit 1.1 – Water Efficient Landscaping
- WE Credit 1.2 – No Irrigation
- WE Credit 3.1 – 20% Water Use Reduction
- WE Credit 3.2 – 30% Water Use Reduction
- EA Credit 1 (6) – Exceed ASHRAE by 28%
- MR Credit 2.1 – Construction Waste 50%
- MR Credit 2.2 – Construction Waste 75%

BCT-H COF LEED Scorecard

- MR Credit 4.1 – Recycled Content 10%
- MR Credit 4.2 – Recycled Content 20%
- MR Credit 5.1 - Regional Materials 10%
- MR Credit 5.2 – Regional Materials 20%
- IEQ Credit 3.1 – Plan During Construction
- IEQ Credit 3.2 – Before Occupancy
- IEQ Credit 4.1 – Low Emitting Glue & Sealant
- IEQ Credit 4.2 – Low Emitting Paint & Coating

BCT-H COF LEED Scorecard

- IEQ Credit 4.3 – Low Emitting Carpet
- IEQ Credit 6.1 – Lighting Control
- IEQ Credit 7.1 – Thermal Comfort Design
- Innov Credit – 40% Manufactured Regionally
- Innov Credit – 40% Water Use Reduction
- Innov Credit – LEED Accredited Professional

Tactical Equipment Maintenance Facilities

- Mortenson – LAD - PBS&J Design Build Team
- Six Buildings - 223,000 Square Feet
- LEED Gold
- 18 Month Design & Build Schedule
- 32 Companies
- Buildings Provide Space for Maintaining Heavy Brigade Equipment

BCT-H TEMF Design Strategies

- Exceed ASHRAE Standards by 30 Percent or Greater – Use of Energy Model
- Super Insulate Building
- Heat Recovery
- Radiant Floors
- Reduce Water Usage
- White TPO Roof

BCT-H TEMF LEED Scorecard

- SS Credit 1 – Site Selection
- SS Credit 2 – Development Density
- SS Credit 3 – Brownfield Redevelopment
- SS Credit 4.1 – Public Transportation
- SS Credit 4.2 – Bike Storage & Showers
- SS Credit 4.3 – Preferred Parking
- SS Credit 4.4 – Parking Capacity
- SS Credit 5.1 – Restore Habitat

BCT-H TEMF LEED Scorecard

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- WE Credit 1.1 – Water Efficient Landscaping
- WE Credit 1.2 – No Irrigation
- WE Credit 3.1 – 20% Water Use Reduction
- WE Credit 3.2 – 30% Water Use Reduction
- EA Credit 1 (6) – Exceed ASHRAE by 28%
- EA Credit 4 – Enhanced Refrigerant Mgmt
- EA Credit 5 – Measurement & Verification
- MR Credit 2.1 – Construction Waste 50%

BCT-H TEMF LEED Scorecard

- MR Credit 4.1 – Recycled Content 10%
- MR Credit 4.2 – Recycled Content 20%
- MR Credit 5.1 - Regional Materials 10%
- MR Credit 5.2 – Regional Materials 20%
- MR Credit 7 – FSC Certified Wood
- IEQ Credit 3.1 – Plan During Construction
- IEQ Credit 3.2 – Before Occupancy
- IEQ Credit 4.1 – Low Emitting Glue & Sealant
- IEQ Credit 4.2 – Low Emitting Paint & Coating

BCT-H TEMF LEED Scorecard

- IEQ Credit 4.3 – Low Emitting Carpet
- IEQ Credit 6.1 – Lighting Control
- IEQ Credit 8.1 – Daylight 75% Space
- IEQ Credit 8.2 – Views 90% Space
- Innov Credits – TBD
- Innov Credit – LEED Accredited Professional

Wilderness Road Complex Aerial View

Ft. Carson Wilderness Road COF and TEMF Project Site

- 160 Acres
- Multiple Contractors Involved
- Overlot Grading by PCL/Blueline
- Road Realignment and Utilities by Torix
- COF and TEMF Buildings by Mortenson
- Hardstand and POV Parking by Bryan



AERIAL VIEW



Company Operations Facilities

- Mortenson – LAD - PBS&J Design Build Team
- Six Buildings - 392,000 Square Feet
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- 32 Companies; Over 3,800 Soldiers Total
- Buildings House Administrative Operations and Provide Storage for Soldier Supplies and Equipment

WR COFs - What We Did Different

Tactical Equipment Maintenance Facilities

- Mortenson – LAD - PBS&J Design Build Team
- Six Buildings - 223,000 Square Feet
- LEED Gold
- 18 Month Design & Build Schedule
- 32 Companies
- Buildings Provide Space for Maintaining Heavy Brigade Equipment

WR TEMFs – What We Did Different



Brigade Battalion Headquarters

- Mortenson – RSP Design Build Team
- 138,000 Square Feet
- LEED Gold
- 18 Month Design & Build Schedule
- 32 Companies
- Buildings Provide Space for Maintaining Heavy Brigade Equipment

WR BBHQ Design Strategies

WR BBHQ – LEED Scorecard

- SS Credit 1 – Site Selection
- SS Credit 2 – Development Density
- SS Credit 3 – Brownfield Redevelopment
- SS Credit 4.1 – Public Transportation
- SS Credit 4.2 – Bike Storage & Showers
- SS Credit 4.3 – Preferred Parking
- SS Credit 4.4 – Parking Capacity
- SS Credit 5.1 – Restore Habitat

WR BBHQ – LEED Scorecard

- SS Credit 7.2 – Heat Island Roof
- WE Credit 1.1 – Water Efficient Landscaping
- WE Credit 1.2 – No Irrigation
- WE Credit 3.1 – 20% Water Use Reduction
- WE Credit 3.2 – 30% Water Use Reduction
- EA Credit 1 (6) – Exceed ASHRAE by 28%
- EA Credit 4 – Enhanced Refrigerant Mgmt
- EA Credit 5 – Measurement & Verification
- MR Credit 2.1 – Construction Waste 50%

WR BBHQ – LEED Scorecard

- MR Credit 4.1 – Recycled Content 10%
- MR Credit 4.2 – Recycled Content 20%
- MR Credit 5.1 - Regional Materials 10%
- MR Credit 5.2 – Regional Materials 20%
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- IEQ Credit 3.1 – Plan During Construction
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- IEQ Credit 4.1 – Low Emitting Glue & Sealant
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WR BBHQ – LEED Scorecard

- IEQ Credit 4.3 – Low Emitting Carpet
- IEQ Credit 6.1 – Lighting Control
- IEQ Credit 8.1 – Daylight 75% Space
- IEQ Credit 8.2 – Views 90% Space
- Innov Credits – TBD
- Innov Credit – LEED Accredited Professional

Lessons Learned

- Super Insulate
- Save Water
- Enhanced Commissioning
- 30% Over ASHRAE Guarantee Leads to Higher Performing Buildings
- Building Orientation

Future Opportunities

- Advance Lighting Control Systems
- LED Lighting
- Evaporative Cooling
- Photovoltaic Farm
- Flat Photovoltaic on Roof
- Branch Circuit/Motor Metering
- Solar Water Heating for Building Heat
- Control System Options
- Solar Domestic Hot Water Heating
- Additional Roof Insulation
- Higher Performing Glass
- Vertical Wind Turbines on Building

Questions?

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