Five Principles of a HIGH PERFORMANCE DETENTION CENTER
Agenda

- Five Principals of a High Performance Detention Center

- Douglas County Law Enforcement and Detention Center - Case Study

- What is Next - A Challenge for the Future

- Discussion

A Sustainable Approach to Better Detention Projects
Five Principals:

1. Support Efficient Operations
2. Optimize Staff Environment
3. Reduce Life Cycle Costs
4. Optimize Budget
5. Contribute to a Sustainable Community
Douglas County Law Enforcement and Detention Center
Douglas County
• Suburban Atlanta
• 130,000 Residents
• Current Jail – Downtown
• County Master Plan

Courthouse

Site

POETIC PRAGMATISM
2011 Academy of Architecture Justice National Conference
CELEBRATING CREATIVE, COST EFFECTIVE, AND FUNCTIONAL DESIGN FOR JUSTICE FACILITIES
RFQ

- Needs Assessment - 2009
- 550,000 SF
- 107 Million Splost
- 45 Acre Site
- Program Manager
- CM at Risk
- 30 Month Schedule
Proposal

- High Performance
- Small Team
- Right Size
- Right Orientation
- Quick Start
- Aggressive Schedule
- Passive Solar

Future County Offices

Facility

Town Square
Performance Based...
### Program

- Right Size
- Reduced Budget
- 10% Reduction
- Share Spaces
- No Excess
- Operations Oriented
- Staff Focused

**Program Summary**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Total Cost</th>
<th>Test Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Main Living**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Total Cost</th>
<th>Test Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cost Breakdown**

- **Total Cost:** 32,000
- **Test Cost:** 3,000
- **Total Reduction:** 10%
- **Operations Oriented:** Yes
- **Staff Focused:** Yes
Solution

- North / South Axis
- Compact Footprint
- Open Green Space
- Native Landscaping
- No Irrigation
- Office Park Setting
- No Fences
- Future Expansion
- Community Connectivity
Flexible Design

Direct / Indirect
Clear Expansion Strategy
Prefabricated Steel Cells
Rear Chase
- 60 Beds
- Therapeutic
- Safety
- Clear Planning
- Good sightlines
- Daylight

Medical / Mental Health
Maximum Security
Video Visitation

- Public ease
- Secure
- Staff efficient
- Flexible
- Reduces facility wear and tear
- Secure
- Outside Jail
- Trustees / work detail
- Cost effective
- Pre-engineered
- $1 M in savings

Dormitory
BUILDING SUSTAINABILITY

• North / South Axis
• Passive Solar Orientation
• Insulated Rear Chase to East and West
• Major windows to North and South
• Narrow floor plate for LEC
• Maximize Daylight Throughout
• Code Minimum Building

Result
• Energy Model – 18% improvement over baseline
• Potentially $250,000 annual utility savings
• Minimal MEP Enhancements
• $200 SF
LEED

- Energy Model 18% = 3 pts.
- Community Connectivity = 5 pts.
- Site = 17 out of 26 available
- 20% Regional Materials
- 20% Recycled Materials
- 90% + Waste diverted from landfills
- Education
- Pilot Program - Enabled Energy in Structure

Project Upgrades

- Enhanced Filters, Copy Rooms,
- Parking signage
- 498,000 SF
- 1,500 Beds
  - expandable to 2,250
- $101 Million
- $200 SF
- LEED Pending
- Direct / Indirect
- Design Start
  - March 2010
- Construction Complete
  - December 2012
Support Efficient Operations
Design

• Support Current Style
• Allow Flexibility
• Bring Other Thoughts to the Table
• “Right Size Facility”
• Master Plan For Future
• Straight Forward Solution
• Simplify, Simplify, Simplify….
<table>
<thead>
<tr>
<th></th>
<th>MID-RISE</th>
<th>HIGH-RISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Cost</td>
<td>$106,250,000</td>
<td>$125,000,000</td>
</tr>
<tr>
<td>Operational Costs</td>
<td>- 5%</td>
<td></td>
</tr>
<tr>
<td>Energy Costs</td>
<td>$3.00 / SF</td>
<td>$4.50 / SF</td>
</tr>
</tbody>
</table>
Douglas County  Adult Detention and Law Enforcement Center

1500 beds @ $ 83,333 = $ 124,999,995

Annual Expense

Capital Cost
20 Yr. Bond @ 4.5% = $ (10,030,323)

Staffing
400 FTE @ $ 40,000 = $ 16,000,000

Inmate Expenses
1500 x 365/ yr $ 8 = $ 4,380,000

Misc. Overhead
1500 x 365/ yr $ 12 = $ 6,570,000

TOTAL = $ 36,980,323

$ per inmate per day = $ 67.54
Considerations:

- Medical & Mental Health
- Borrowed Light
- Perimeter Chase
- Video Visitation/Arraignment
- Open Booking
- Energy Management
- Sustainability
- Law Enforcement
Less is More

- Clear Planning
- Direct Sightlines
- Better Way finding
- Improved Security
- Easier To Build
- Less Expensive

= Improved Operations
Optimize Staff Environment
Staff – A 30 Year Sentence

• Single greatest investment
• Detention / Retention
• Positive Environment
• Convenience
• Security
• Interaction
• Training
• Normalize
• Invest in People

30-YEAR LIFE CYCLE COSTS

- Officer's Salaries 50.1%
- Civilian Salaries 23.6%
- Utilities 6.2%
- Food 5.6%
- Maintenance Supply 4.5%
- Construction 8.7%
- Furniture & Equipment 1.0%
- A/E Fees 0.5%
Improve Daily Life

- Staff / Public / Detainees
- Translates into Savings
- Improved Moral
- Clear Expectations
- Efficiency
- TIME
Natural Light

• Reduces Stress
• Improves Well-Being
• Saves Energy
• Creates Better Environment
• Proven

DAYLIGHT, DAYLIGHT, DAYLIGHT......
Support Spaces

- Training
- Lockers / Work-out
- Parking
- Break Areas
- Daylight
- Security
Clean Air

- Better Attitude
- Code Requirements
- Air Flow
- Showers
- Odor Control – Housing / Property
- Improved Environment
Noise Control

- Acoustics
- Ceiling / Wall Panels
- Costs
- Staff and Inmate Benefits
- Sound Level "Driving Me Crazy"
Sanitation

- Cleaning
- Products - Green
- Inmate Trustees
- Garbage
- Recycling
Reduce Life-Cycle Costs
Reduce Load

- Right size
- Orientation
- Local Climate
- Correct Building Orientation
- Energy Model
- Code Minimum and Efficient
Façade and Orientation

Implementing several parallel analyses
To balance glare, perimeter heat gains and day lighting at optimal levels
Detailing Specific Conditioning Strategy

**Summer Conditions**
- 09:00 Average Temperature: 18-23°C outside
- 12:30 Average Temperature: 21-29°C outside
- 04:00 Average Temperature: 21-29°C outside

**Spring/Fall Conditions**
- 09:00 Average Temperature: 16-19°C outside
- 12:30 Average Temperature: 18-23°C outside
- 04:00 Average Temperature: 18-23°C outside

**Winter Conditions**
- 09:00 Average Temperature: -10-0°C outside
- 12:30 Average Temperature: -5-0°C outside
- 04:00 Average Temperature: -7-0°C outside
Detailing Specific Conditioning Strategy

Energy Savings
Achieved by employing strategies above and beyond the traditional level.
Multiple benefits from singular activities

- Daylighting
  - Building design
    - Operable windows
      - Reduce utility consumption
- Orientation, form/height, glazing
  - Electrical
    - Reduce lighting thru controls
    - Reduce cooling loads
  - Mechanical
    - Reduce solar loads
    - Alternative technology — chilled slabs...

Passive systems, simple, user-friendly — comfort/health/productivity
A Bundled Approach........
Solar Thermal System
Photovoltaic electrical

High Perf. Envelope
Day lighting/Controls
High Efficiency Lighting
Operable Windows/ Fans
Radiant Systems/ DOAS
Reduced Equipment Load

TONS OF CO2 SAVINGS
80%

RENEWABLE ENERGY
Optimize Budget
Right Size Building

- Reduce Program
- Combine Functions
- Do More with Less
- Alternate Programs
Suitability of Materials

- Durability
- Cost
- Regional
- Recycled
- Maintenance
WATER – An Emergency

• Landscaping
• Cisterns
• Showers
• Penal Toilets - 1.28GPF
• 42,000 gal/day
Systems

- Durability
- Materials
- Staff Abilities
- Trustee Abilities
- Service
- Maintenance
- Life Cycle Costs
Market

- Move Quickly to Capitalize
- Keep Field Open
- Consider Trends in Market
- Design Flexibility
- Add Alternates
- Estimates
Contribute To A Sustainable Community
Invest in People

• Justice - Third Largest Employer in Nation
• STAFF FIRST - Single Greatest Expense
• Community - Contribute, Employ, Visit
• Detainees - Safety, Due Process, Rehabilitate
• Net positive Influence
Design Community

• Staff / Operations Focus

• Understand Actual Costs – Staff / Life Cycle

• Develop Clearing House of Information

• Challenge Your Clients – What can your Facility achieve?
What’s NEXT?
Building Science – Integrated Approach

*Performance based future for detention* ......

- Consider the environment
- Systems focused
- People centric
- Establish metrics
1 Discovery + Definition

Climate and Place Analysis
Benchmarking
Renewable Energy Opportunities
Finding the Right Balance
REDUCING THE LOAD
– FINDING THE RIGHT BALANCE
EXCHANGING EFFICIENCIES FOR RENEWABLES: THE 80-20 BALANCE

Reducing the load by 80 percent using today’s technology will require a whole new type of architecture.”
2 Macro-Scale Strategies

Massing and Orientation
Site and Planning Concepts
3 Passive Strategies

- Final plan and Section
- Site Development Improve envelope thermal efficiency
- Redefine comfort standards
- Implement passive heating and cooling strategies
- Solar energy and solar thermal sources
- Natural light for day lighting and sunlight for heating
- Shading of glass to reduce cooling loads
- Locate energy supply close to point of use
- Selective glass and composite glazing systems
Realization:
REGIONAL ISSUES DICTATE OUTCOMES

1. Cost of electricity
2. Source of electricity
3. Climate
4. Incentives

*Some states are more advantaged than others!*
What did we learn?

PROCESS

FORM Follows PERFORMANCE:

Model, Measure, Manage

Cost Trading

Every BTU counts: No silver bullet

Integrated role of team players is essential
What did we learn?

It’s About People....
Buildings do not use energy

- People do...
AND YOU?
Triple Net Zero……

Zero Turnover
- Staff First
Zero Waste
- Site
- Building
- Construction
Zero Energy Consumption
- Reduce Load
- Create Energy