Innovations & Sustainable Features: Northwest Ohio Trans-Shipmen Terminal & Central Florida Intermodal Logistics Center

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Northwest Ohio Trans-Shipmen Terminal – North Baltimore, Ohio

SUSTAINABLE TERMINAL 1.0

NWOH
Northwest Ohio Trans-Shipment Terminal - Sustainable Terminal 1.0
North Baltimore, OH
Highlights of Innovations & Sustainable Features

1. Extended Lead Track
2. Automated Rail Portal
3. Innovative Terminal Operating System
4. Straight-Center Ladder Classification Tracks
5. Wide Span Electric Cranes Processing Tracks
6. Efficient Trackside Area
7. Semi-Automated Terminal Gate

Winner of Gold & Silver Level Award of Excellence from Ohio EPA
Wide Span Electric Cranes

- 7 state of the art, electric, rail-mounted Wide Span Cranes (WSC)
- Designed and constructed by Hans Kuenz GmbH of Austria
- Produce ZERO emissions and generate much less noise than conventional diesel equipment
- Regenerate 60% power back to the terminal grid
- Provide 400% increase in lift power (vs. conventional terminals)
Green Features

- **NARSTCO steel ties**: recycled and recyclable, eliminates the need for creosotes, lower lifecycle costs
- **100% recycled plastic composite crossings**: reduce the use of source materials, reliable, skid-resistant surface
Standard LEED-Certified Crew Building

- Recycled content and regional materials utilized
- Innovative design including non-roof heat island
- Natural stormwater control around building perimeter
- 35% reduction of water use
- Optimized Energy Performance (use of Green Power)
  - Upgraded HVAC
  - Energy-efficient lighting
- 1,350 sq foot fitness center
Stormwater Management

- Self-sustaining controls provide runoff and water quality management
- Retention basins with forebays and oil-water separators provide environmental protection

![Integrated stormwater controls](image1)

![Oil-water separator](image2)

![Stormwater retention ponds and forebays](image3)
Terminal Operating System

- Customized “Intermodal PRO” (IPRO) System supports EVERY operational process in the terminal
  - Shares information via wireless network
  - Coordinated rail car positions, crane alerts & events, blue flag status, and move requests & confirmations
  - Enhances efficiency & safety

- Mi-Star System:
  - For precision tracking & inventory management
  - To generate warning & safety zones
  - To manage crane work order requests
Automated Gate System

- Expedites inbound & outbound cargo processing
  - Reduces transaction time, truck idling time, exhaust emissions
- Gate Vision System
  - Uses cameras, inspection portals, and license plate recognition to identify trucks and containers
### Environmental Performance

- WSCs save 537,000 gallons of diesel per year
- Lower diesel fuel use results in lower emissions
- LEED-certified crew building reduces water needs by 35% per year

#### Comparison of Conventional Terminal Emissions (No Wide-Span Electric Cranes) to Emissions from the CSX NWOH Terminal (with Wide-Span Electric Cranes)

<table>
<thead>
<tr>
<th>Type of Terminal</th>
<th>HC</th>
<th>CO</th>
<th>NOₓ</th>
<th>PM</th>
<th>CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Terminal (No WSEC)</td>
<td>19,143</td>
<td>92,091</td>
<td>267,837</td>
<td>21,363</td>
<td>15,225,597</td>
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<tr>
<td>CSX NWOH WSEC Terminal</td>
<td>4,748</td>
<td>22,847</td>
<td>72,551</td>
<td>4,198</td>
<td>3,202,703</td>
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<tr>
<td>Annual Reductions (pounds/year)</td>
<td>14,395</td>
<td>69,244</td>
<td>195,286</td>
<td>17,165</td>
<td>12,022,894</td>
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</table>

- A 6,000 TON per year reduction in CO₂!

#### Estimated Water Savings in 2013

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Estimated Water Usage without Water Efficient Technology</td>
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<tr>
<td>Actual Water Usage with Water Efficient Technology</td>
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<tr>
<td>Estimated Annual Water Savings</td>
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</table>
Central Florida Intermodal Logistics Center – Winter Haven, Florida

SUSTAINABLE TERMINAL 2.0

WH
Central Florida Intermodal Logistics Center, Winter Haven, FL
Sustainable Terminal 2.0
Highlights of Innovations & Sustainable Features

- 3 state of the art, electric, rail-mounted Wide Span Cranes
- 4 LEED Silver-certified buildings
- LED lighting across the facility
- Photovoltaic solar panels
- Engine-ready track
- Recycled steel ties
- Pervious parking areas & stone container stacking area
- Innovative storm water management
- Grey water irrigation
- Environmental controls to protect Florida’s ecosystem

- 2015 Sustainable Florida Best Practice Award Finalist

318-acre facility
Winter Haven Terminal Layout & Features

- 2-10,000 TF Arrival/Departure Tracks
- 1,060 Empty Container Stacking Capacity (4 High)
- 5 – 3,000 TF Processing Tracks
- 3 Kuenz WSC
- 880 Container Stacking Capacity (4 High)
- 186 Container Transfer Lanes
- 328 Parking Spaces
  - Capacity = 212,000
  - Switching by EVWR

Roadability and Maintenance Building
Crew Building & Operations and Welfare Building
Administration Building
Gate
Innovative Technology Common to NWOH

- **Wide Span Electric Cranes (WSEC)**
  - 3 state of the art, rail-mounted, WSECs
  - Reduces the need for internal drayage
  - Produces regenerative power – Up to 2.3 kWh per descend to be used within the terminal
  - 100% Electrical Redundancy from TECO Energy

- **Terminal Operating System: IPRO**
  - Reconfigured specifically for Winter Haven
  - Semi-automated container moves improve efficiency and fluidity of the WSECs
  - 6.5 miles of fiber cable laid for wireless LAN & CCTV network (with 20 megapixel cameras) – connects cranes, hostlers, and gate into IPRO

- **X-Gate (Fully Automated Gate System)**
  - Expedites inbound & outbound cargo processing
  - Gate Vision System
LEED-Certified Buildings

- All 4 buildings are certified LEED Silver – they support all terminal operations in 15,067 sq. ft. (Administrative Building, Crew Building, Operations & Welfare Building, Roadability Building)
- Construction methods driven to use local material, reduce waste
- Certified buildings conserve energy & resources, reduce water consumption, and provide improved indoor & outdoor air quality
LED Lights

- All Exterior Fixtures LED
- First large-scale application of all LED Holophane High Mast Light Towers in North America
- Glare resistant & “cut-off” at the facility perimeter
- Benefits:
  - Over 100,000 hours service life
  - Over 50% energy savings
  - 50% maintenance cost savings
  - “Whiter” light provides better visibility
- Monitoring system
  - Available remotely
  - Can turn off individual lights

High Mast Tower 40’ Entrance Road Fixture Cut-Off Fixture
Solar Power

- Solar power panels on roofs of all 4 buildings
- Solar-powered hydraulic switches
- Solar-powered signs
- Excess power is fed to grid – used in other parts of the terminal
Engine-Ready Track

- Intended for locomotive storage (between trips) and limited mobile fueling
- Measures are taken to prevent spills from entering the stormwater system
- Circular zone of containment – Can contain up to 14,000 gallons
  a) Petroguard Barrier – Placed under track & ballast to keep contaminants out of groundwater
  b) Baffle Chamber – Contains small spills and protects ponds from sheens
  c) Sluice Gate – Can be closed in the event of a spill
  d) Forebays – Keep spills out of ponds
Track Materials

- Most track materials delivered via rail
  - Rail (18 cars)
  - Steel & Wood Ties (25 cars of steel ties, 11 cars of wood ties)
  - Subballast, ballast & concrete materials

- Over 230,000 tons of stone delivered via rail – kept nearly 9,000 trucks off the road!

- Process tracks made of steel ties – 100% recycled steel and recyclable after end of useful life at facility
Empty Container Stone Crib

- Less expensive alternative to pavement – Applied in Asian and European Ports for 20 years
- Shorter construction timeframe
- Larger stone chosen to prevent “gravel spillage” which prevents gravel from sticking to containers
- Subgrade compacted to meet requirements of future tracks (area for 3 future process tracks)
- Ballast materials – placed to create pervious container stacking area – can be reused for future track, when regraded
Pervious Pavement

- Pavers in Employee Parking Areas
- LEED Credit
- Allows percolation to subsurface
- Reduces stormwater treatment needs

Pavers during construction
Stormwater Ponds

- 60 acres of ponds onsite, interconnected via pipes and ditches to one single outfall location
- Forebays at key locations to prevent sediment and potential petroleum contamination impacting the stormwater system
- Littoral Shelf – Plantings within the pond to aid in the treatment of the runoff
- No sampling requirements
Landscape & Irrigation

- Zoysia Grass
  - Drought Tolerant
  - Less maintenance – slower growing, less mowing, minimal fertilizer use

- Native trees and plants locally sourced

- Grey water irrigation
  - Irrigation provided by ponds
  - Future infrastructure in place to connect to reclaimed water system once it becomes available
Economical Buffer Selection

- Original development agreement was to install a screen wall as a buffer
- Worked with the City to agree on a Landscaped Buffer instead – resulted in project savings of $950,000.
Environmental Performance
Winter Haven Terminal – Sustainable Terminal 2.0

- WSECs save over 246,500 gallons of diesel per year
- Lower diesel fuel use results in lower emissions

Comparison of Conventional Terminal Emissions (No Wide-Span Electric Cranes) to Emissions from the CSX Winter Haven Terminal (with Wide-Span Electric Cranes)

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<tr>
<td>Conventional Terminal (No WSEC)</td>
<td>8,423</td>
<td>40,700</td>
<td>118,599</td>
<td>9,233</td>
<td>7,021,413</td>
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<tr>
<td>Winter Haven WSEC Terminal</td>
<td>2,209</td>
<td>9,885</td>
<td>31,479</td>
<td>2,486</td>
<td>1,503,309</td>
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<td>Annual Reductions (pounds/year)</td>
<td>6,214</td>
<td>30,815</td>
<td>87,120</td>
<td>6,747</td>
<td>5,518,104</td>
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- Approximately a 2,750 TON per year reduction in CO₂!
Health and Wellness

- Onsite center available to all CSX Intermodal Terminals employees and CSX Transportation employees
- 9 pieces of state of the art equipment
SUSTAINABLE TERMINAL 3.0
Reduce the environmental footprint of our operations,

Engage openly on sustainability issues,

Support sustainable development...

... to become...

- A leader in fuel/energy efficiency
- An engine of environmentally and socially responsible growth and development
QUESTIONS?