



## **Innovations & Sustainable Features: Northwest Ohio Trans-Shipments Terminal & Central Florida Intermodal Logistics Center**

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Northwest Ohio Trans-Shipment Terminal – North Baltimore, Ohio

# ***SUSTAINABLE TERMINAL 1.0***



# 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**

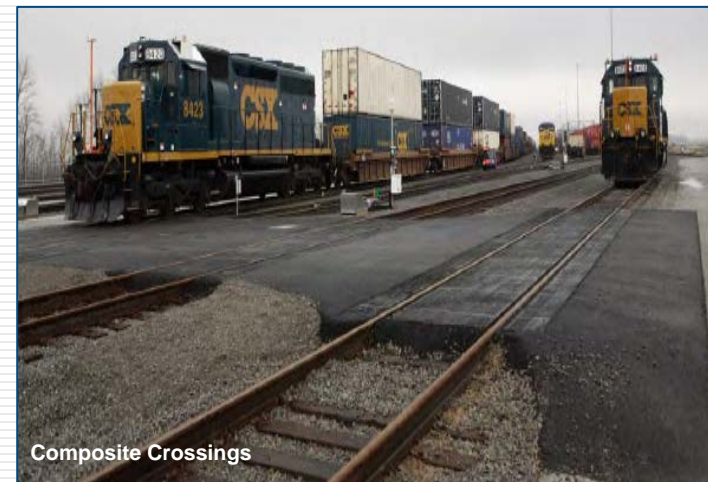
# Wide Span Electric Cranes

NWOH

- 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)



- **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



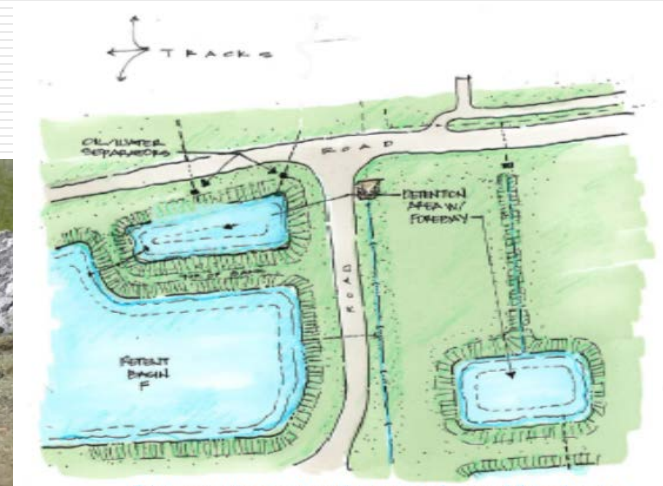
- Self-sustaining controls provide runoff and water quality management
- Retention basins with forebays and oil-water separators provide environmental protection



Integrated stormwater controls



Oil-water separator



Stormwater retention ponds and forebays

# 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)

| Emission Reductions (pounds/year)      |               |               |                 |               |                   |
|--|---------------|---------------|-----------------|---------------|-------------------|
| Type of Terminal                       | HC            | CO            | NO <sub>x</sub> | PM            | CO <sub>2</sub>   |
| Conventional Terminal (No WSEC)        | 19,143        | 92,091        | 267,837         | 21,363        | 15,225,597        |
| CSX NWOH WSEC Terminal                 | 4,748         | 22,847        | 72,551          | 4,198         | 3,202,703         |
| <b>Annual Reductions (pounds/year)</b> | <b>14,395</b> | <b>69,244</b> | <b>195,286</b>  | <b>17,165</b> | <b>12,022,894</b> |

➤ **A 6,000 TON** per year reduction in CO<sub>2</sub>!

## Estimated Water Savings in 2013

| Estimated Water Savings                                  |                        |
|--|------------------------|
| Estimated Water Usage without Water Efficient Technology | 3,142,125 gallons      |
| Actual Water Usage with Water Efficient Technology       | 2,327,500 gallons      |
| <b>Estimated Annual Water Savings</b>                    | <b>814,625 gallons</b> |

Central Florida Intermodal Logistics Center – Winter Haven, Florida

# ***SUSTAINABLE TERMINAL 2.0***



# Central Florida Intermodal Logistics Center, Winter Haven, FL

## Sustainable Terminal 2.0

### Highlights of Innovations & Sustainable Features

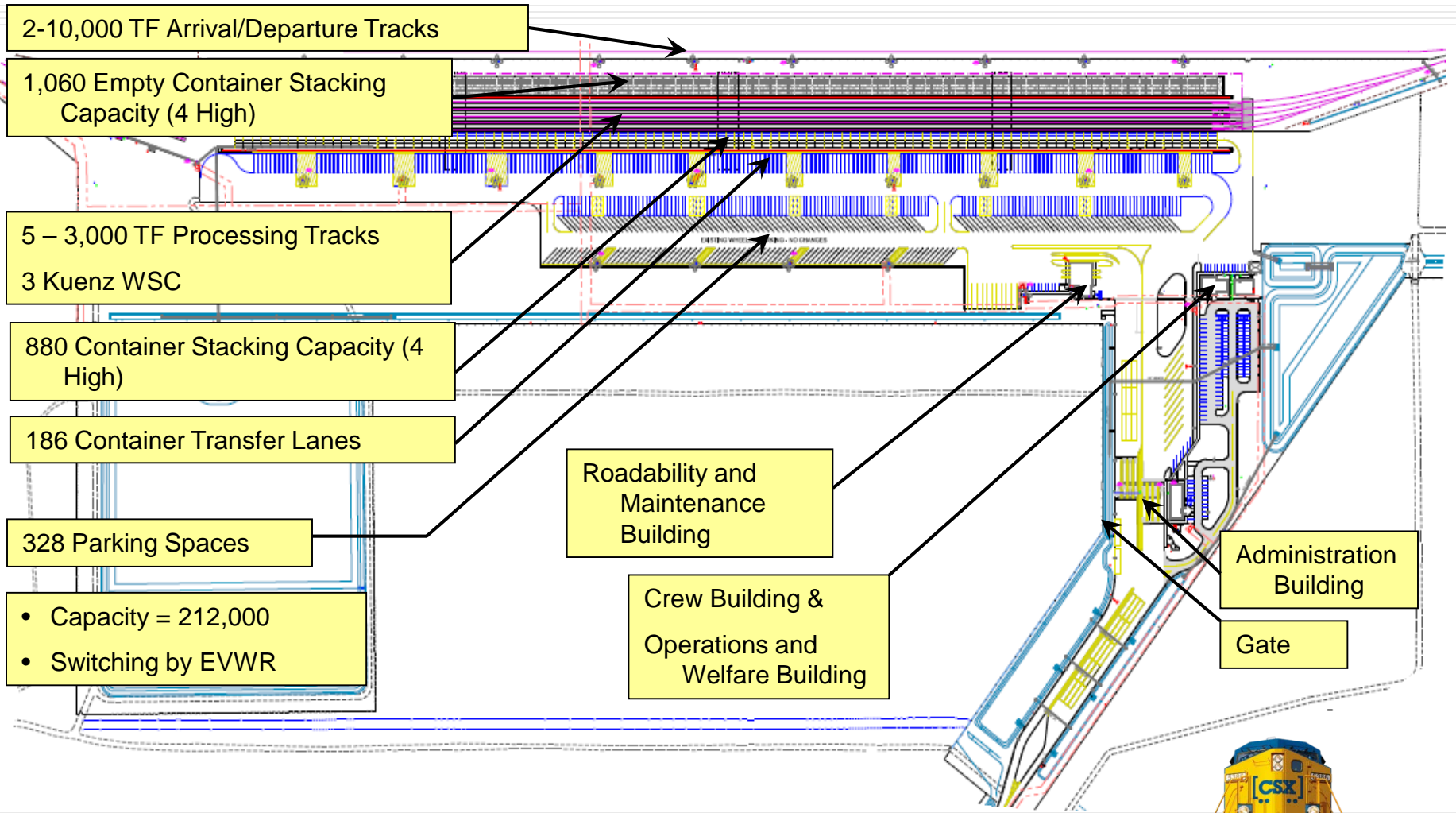


*318-acre facility*

- 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



# Winter Haven Terminal Layout & Features



# 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



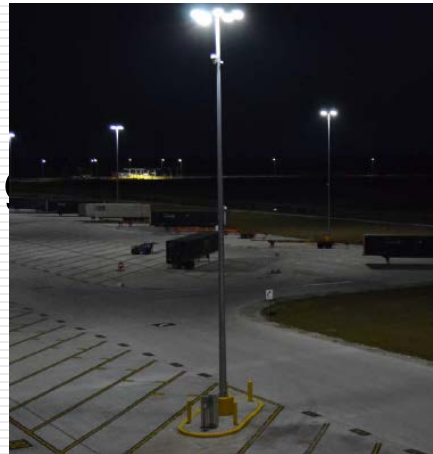
- All 4 buildings are certified LEED Silver – they support all terminal operations in 15,067 sq. ft. (Administrative Building, Crew Building, Operations & Welfare Building, Roadability Building)
- Construction methods driven to use local material, reduce waste
- Certified buildings conserve energy &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



# LED Lights



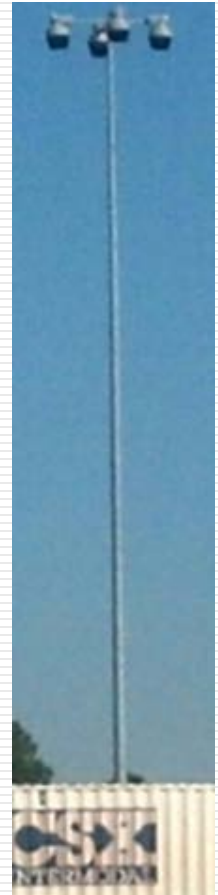
- All Exterior Fixtures LED
- First large-scale application of all LED Holophane High Mast Light Towers in North America
- Glare resistant & “cut-off” at the facility perimeter
- Benefits:
  - Over 100,000 hours service life
  - Over 50% energy savings
  - 50% maintenance cost savings
  - “Whiter” light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



*Solar panels on the roof of a Winter Haven facility building*

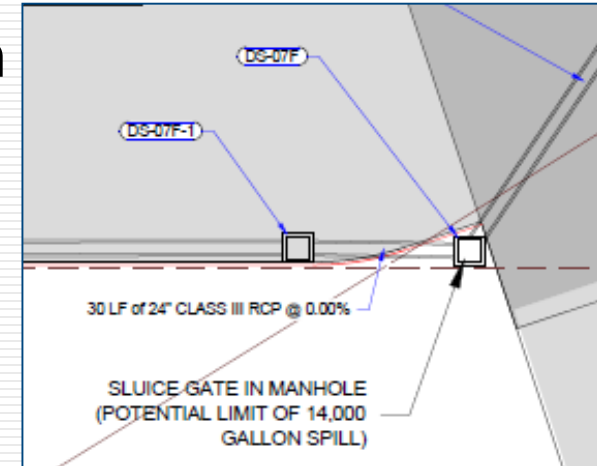


*Solar-powered switches and signs across the Winter Haven facility*

# 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



*Petroguard Barrier*



*Sluice Gate*

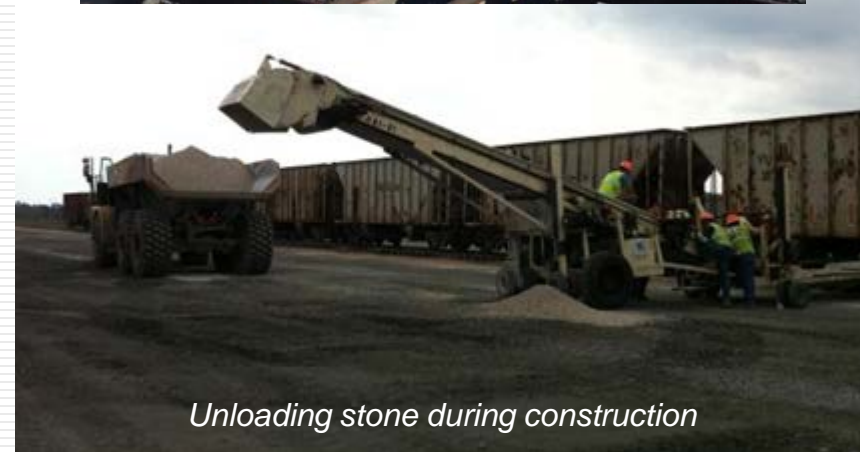
# Track Materials



- 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



*Installing steel ties during construction*

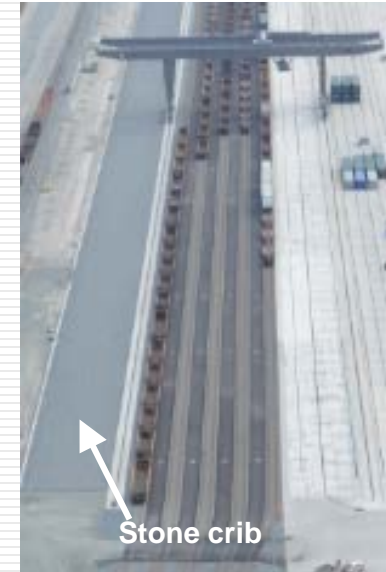


*Unloading stone during construction*

# 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



# 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



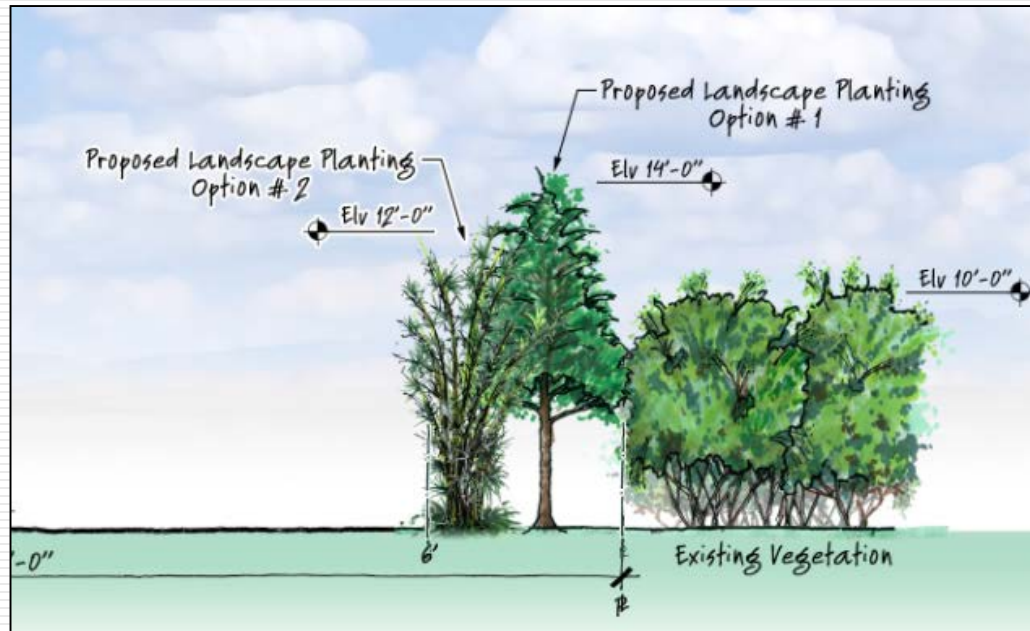
- Zoysia Grass
  - Drought Tolerant
  - Less maintenance – slower growing, less mowing, minimal fertilizer use
- Native trees and plants locally sourced
- Grey water irrigation
  - Irrigation provided by ponds
  - Future infrastructure in place to connect to reclaimed water system once it becomes available



# 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.







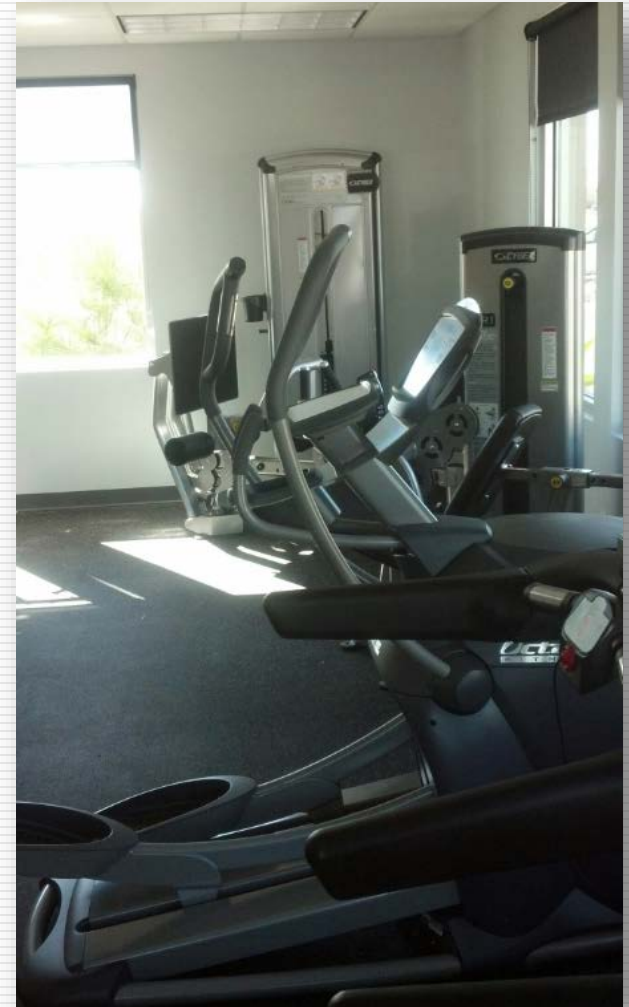
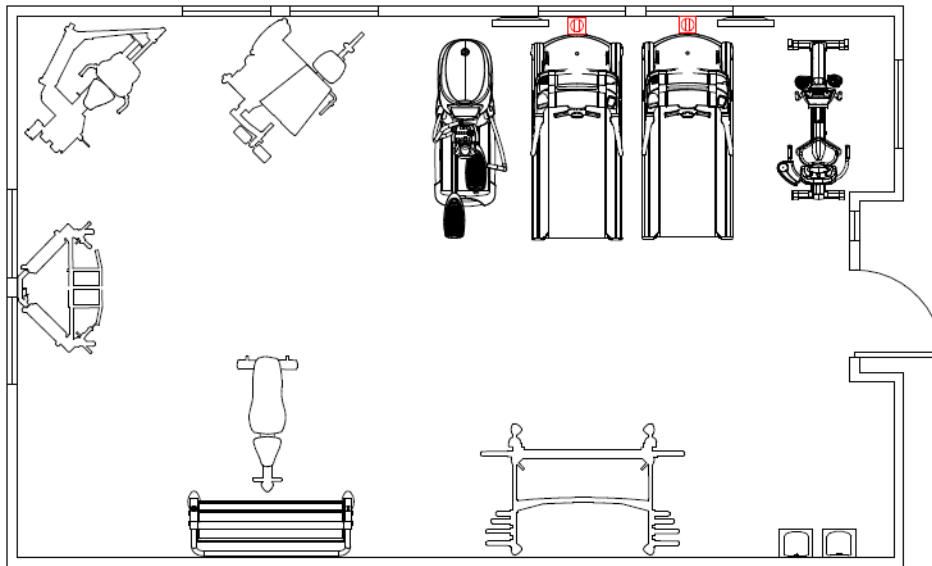
- WSECs save over 246,500 gallons of diesel per year
- Lower diesel fuel use results in lower emissions

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

| Emission Reductions (pounds/year)      |              |               |                 |              |                  |
|--|--------------|---------------|-----------------|--------------|------------------|
| Type of Terminal                       | HC           | CO            | NO <sub>x</sub> | PM           | CO <sub>2</sub>  |
| Conventional Terminal (No WSEC)        | 8,423        | 40,700        | 118,599         | 9,233        | 7,021,413        |
| Winter Haven WSEC Terminal             | 2,209        | 9,885         | 31,479          | 2,486        | 1,503,309        |
| <b>Annual Reductions (pounds/year)</b> | <b>6,214</b> | <b>30,815</b> | <b>87,120</b>   | <b>6,747</b> | <b>5,518,104</b> |


➤ Approximately a **2,750 TON** per year reduction in CO<sub>2</sub>!

- 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***

# Sustainability elements & objectives




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?***