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# Miami Intermodal Center

## Central Station – Rail Node
## East and West Concourses

Risk Assessment – Value Engineering Presentation

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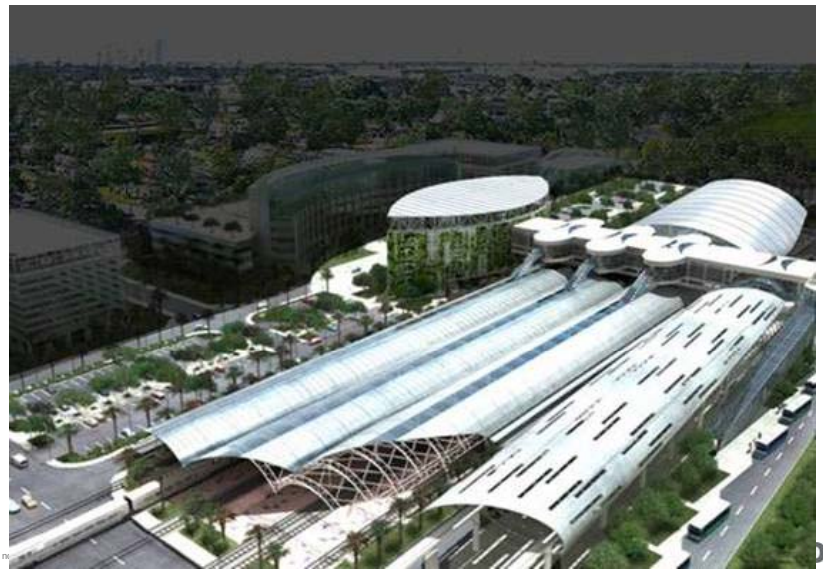
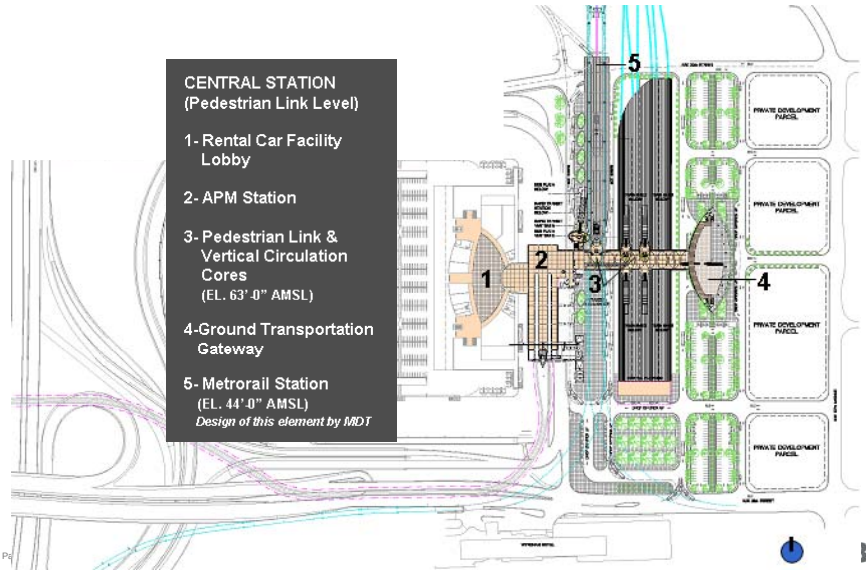
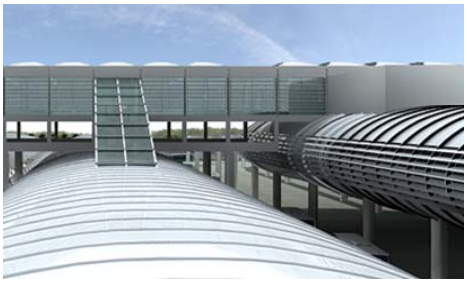
July 29, 2008

## Miami International Airport
## Miami Intermodal Center



# Miami International Airport
# Miami Intermodal Center



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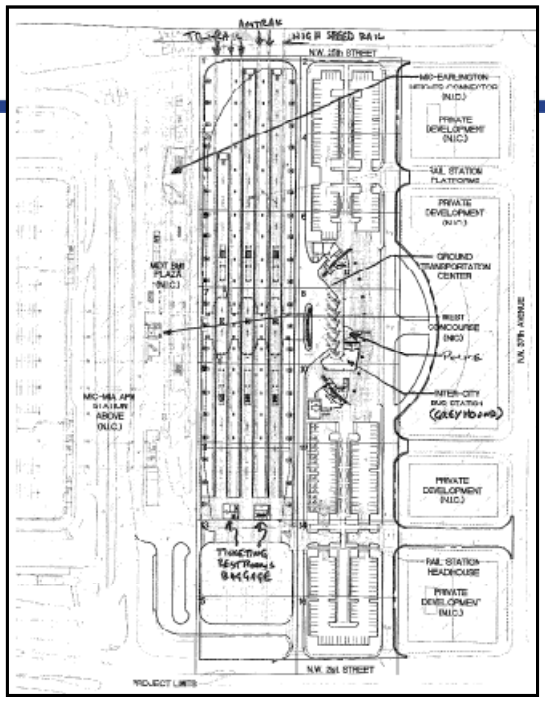
## Plan at Elev. 9’-6”



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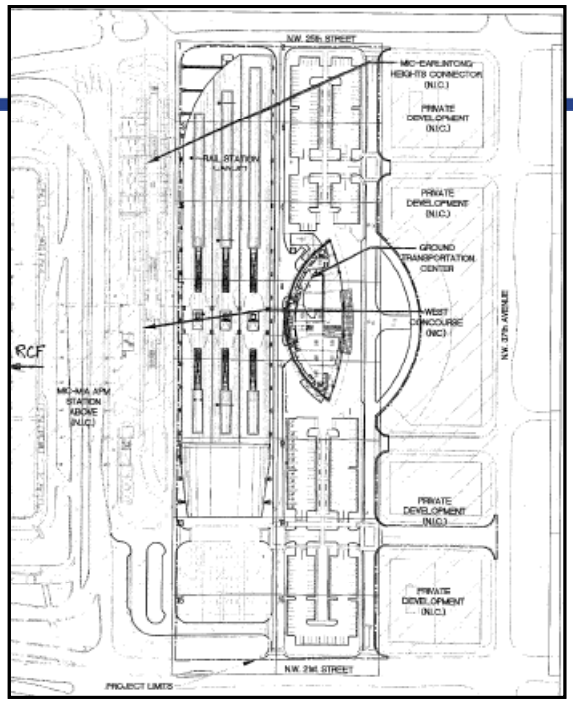
## Plan at Elev. 35’-0”



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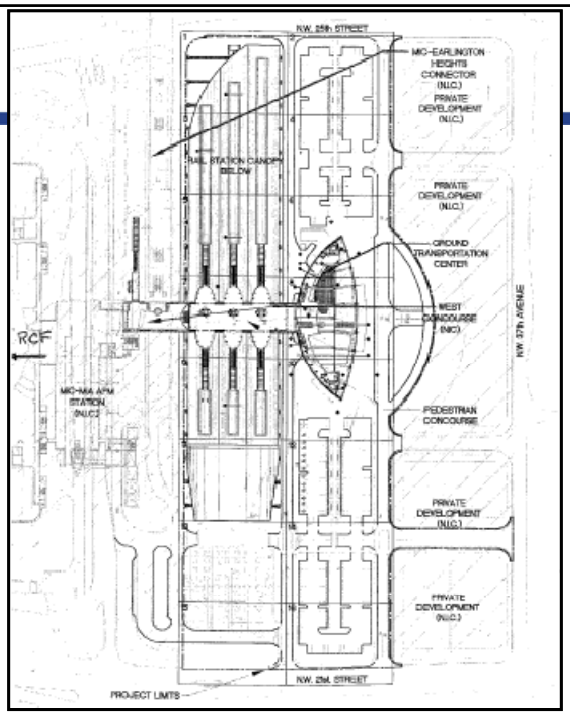
## Plan at Elev. 60’-6”

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## Elevations

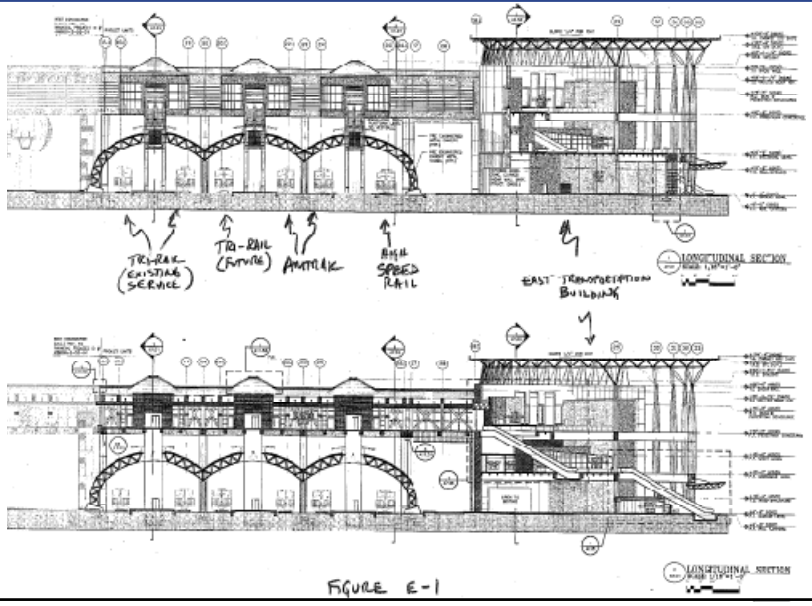


FIGURE E-1

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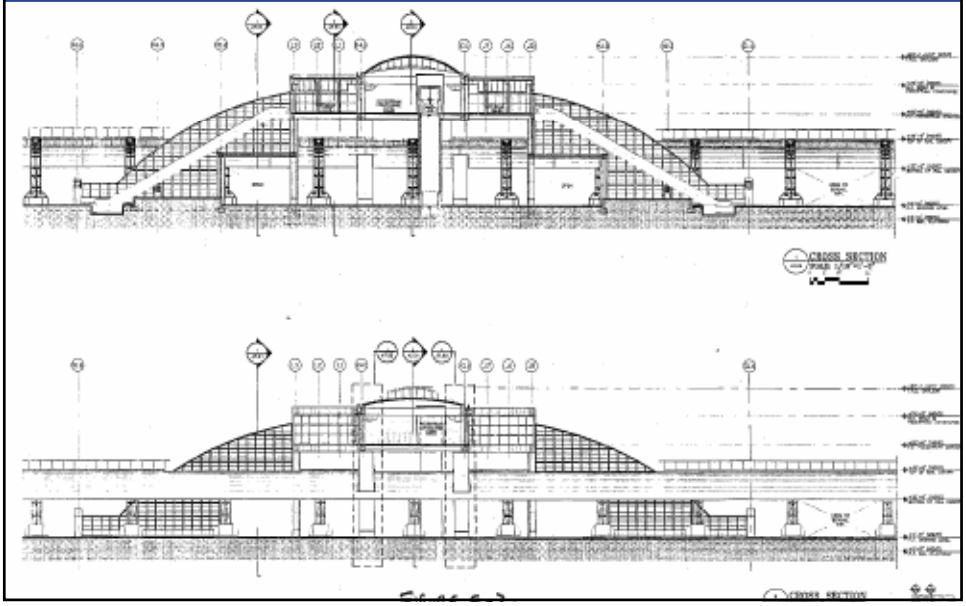
## Elevations



## Funding Versus Projected Cost

- Current Funding: **$ 50 Million**
- 9/07 Probable Cost: **$171 Million**
  - West Concourse: $ 17,995,876
  - East Concourse: $142,746,114
  - Site Development: $ 9,732,192
  - Artwork Allowance: $ 330,000

$170,804,182



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# Qualitative Risk Analysis/ Risk Assessment

## Definitions

**Risk**:

- An uncertain event or condition that, if it occurs, has a positive or negative effect on the project's objectives.*

**Opportunity**:

- A term sometimes assigned to a risk that has a *positive effect*.

If both terms are used, risk usually means those conditions or events that have a *negative effect*.

* Source: *PMI*

# Why Risk Management?

- Better understand possible project outcomes
- Better control project outcomes (cost and schedule)
- Better allocate risks to the party that can best control them throughout the project development and construction process

Source: FHWA Risk Management Workshop course materials, Golder Associates Inc. & Dr. Keith Molenaar, October 9, 2007



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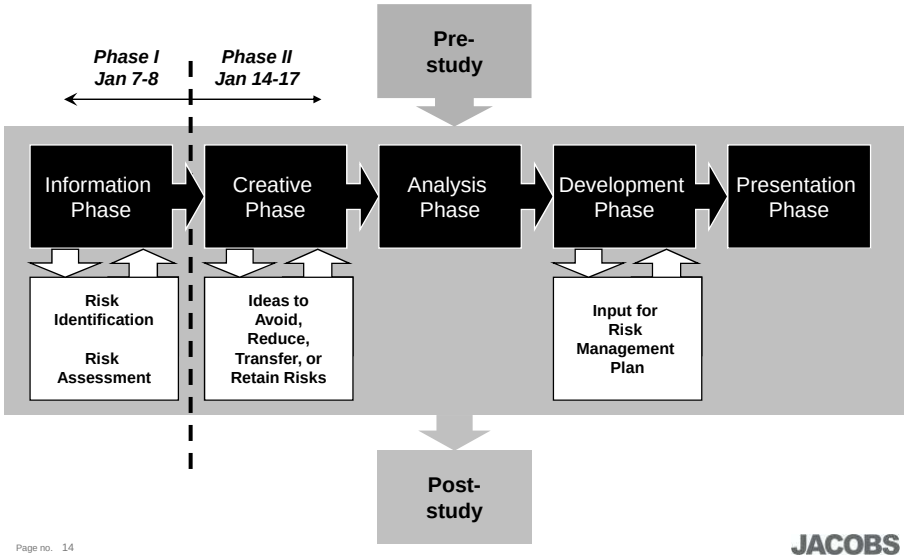
# Value Engineering Process w/Risk Assessment



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## Risk Identification

- Brainstorming
- Emphasis on generating large number of risks
- Don't discuss
- Avoid being overly optimistic
  - What's most likely?
  - What's the worst-case scenario?
- Think broadly



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## Risk Identification

- Generated 39 possible risks
- Greatly benefited from diversity of study team:
  - FDOT Districts 4 and 6
  - South Florida Regional Transit Authority
  - Miami-Dade Transit
  - Greyhound
  - Multi-discipline consultant study team including rail operations expertise



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## Risk Areas

- Funding:
  - Available funding level
  - Impacts due to earlier phase overruns
  - Impacts due to higher bids received for remaining work (WC, garage demolition, temporary platform, track & signals)
  - Impacts due to political changes
  - Unanticipated cost escalation – fuel, weather events
  - Miami factor



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## Risk Areas

- Construction Issues:
  - Amtrak Operational Uncertainty
  - High-Speed Rail Operational Uncertainty
  - CSXT Temporary Rail & Signal Construction
  - CSXT Permanent Rail & Signal Construction
  - Tri-Rail displacement for start of West Concourse
  - MDT approval of plan changes due to VE adoptions
  - Delays to rental car move / garage demolition



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# Risk Areas

- Project Ownership:
  - Finalize inter-agency agreements for construction
    - FDOT, MDT, SFRTA, CSXT, MDC, MIA
  - Design changes required by final owner/operator
  - Design changes due to the building permit process
  - Final security/communication operator & plan



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**RISK ASSESSMENT** — Risk No. 27

Project: **Florida Department of Transportation**
**Miami Intermodal Center**
**Central Station - Rail Node (E & W Concourses)**
**Financial Project ID #406800-2-52-01**

**Risk** *New indirect and cumulative impacts rules from EPA*

**Complete Risk Statement** *(e.g., Undetected soft soil layers may be present (the uncertain event) which would result in higher costs and delays during construction (the consequence).)*
*Adoption of new indirect and cumulative impact rules by EPA would delay receipt of environmental clearance for the project*

**Affected Project Components** *(Indicate those directly affected)*
*All*

**Affected Activity** *(Indicate those directly affected)*

| | | | |
|---|---|---|---|
| ☐ Scope | ☒ Environ. Process | ☐ Construction Funding | ☐ Close Out |
| ☐ Design Funding | ☐ ROW Funding | ☐ Procurement | ☐ Other |
| ☐ Design | ☐ ROW/Utilities | ☐ Construction | |

**Likelihood of Occurrence** *(Explanation/justification for rating)*
*Changes in indirect and cumulative impacts rules have been advertised in the Federal Register; adoption is likely.*

**Risk Likelihood Assessment Guide**

| | |
|---|---|
| **Very High (VH)** | 0.7 to 1.0 (1:1) |
| **High (H)** | 0.4 to 0.7 (2:3) |
| **Moderate (M)** | 0.2 to 0.4 (2:5) |
| **Low (L)** | 0.05 to 0.2 (1:5) |
| **Very Low (VL)** | 0.0 to 0.05 (1:20) |

**Indications of Occurrence** *(Red flags)*
*EPA staffers will probably get early news of adoption*

**Related Risks**
*Litigation, as project opponents may see new rules as justification for new lawsuit*

*Cost escalation*

**Risk to Cost** *(Explanation/justification for rating)*
*Cost of preparing indirect and cumulative impacts analysis is estimated to be ~$100,000. Construction delay expected to subject the project to about 3% cost escalation per year.*

**Cost Risk Assessment Guide**

| | |
|---|---|
| **VH** | >25% of project cost |
| **H** | 10% to 25% |
| **M** | 3% to 10% |
| **L** | 1% to 3% |
| **VL** | <1% |

**Cost Risk**

| Likelihood \ Consequence | VL | L | M | H | VH |
|---|---|---|---|---|---|
| VH | L | M | H | H | H |
| H | L | M | H | H | H |
| M | L | L | M | H | H |
| L | L | L | M | H | H |
| VL | L | L | L | M | H |

**Risk to Schedule** *(Explanation/justification for rating)*
*Completion of indirect and cumulative impact analysis expected to take 4 months, plus another 3-6 months for review and approval.*

**Schedule Risk Assessment Guide**

| | |
|---|---|
| **VH** | >12 months |
| **H** | 6 to 12 |
| **M** | 3 to 6 |
| **L** | 1 to 3 |
| **VL** | <1 |

**Schedule Risk**

| Likelihood \ Consequence | VL | L | M | H | VH |
|---|---|---|---|---|---|
| VH | L | M | H | H | H |
| H | L | M | H | H | H |
| M | L | L | M | H | H |
| L | L | L | M | H | H |
| VL | L | L | L | M | H |

Prepared by: *G. Myers* — Date: *1/3/2008*



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# Risk Register

| | | | | RISK REGISTER - SORTED BY COST RISK | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Project: | Florida Department of Transportation<br>Miami Intermodal Center<br>Central Station - Rail Node (E & W Concourses)<br>Financial Project ID #406800-2-52-01 | | | | |
| Risk ID | Cost Risk Rank | Sched. Risk Rank | Risk | Description | Affected Component | Affected Activity | Likelihood of Occurrence | Cost Consequence | Cost Risk |
| 17 | 1 | 15 | Feasibility of operation not demonstrated | The existing design does not demonstrate feasibility to facilitate the effective movement of passengers through the facility to support multimodal connections. Passenger circulation that is too long or circuitous will discourage effectiveness of the facility. (Note: high cost impact based upon opportunity cost of money invested in circulation - concourse, escalators, and elevators) | All | Scope, Design, construction | VH | VH | H |
| 18 | 1 | 15 | Amtrak use uncertain | Elements of the design are affected by presumption that Amtrak will actually extend service to facility (Note: high cost impact based upon opportunity cost of money invested in Amtrak platform and concourse spanning area to be used by Amtrak) | Concourse, platforms, canopies, escalators | Construction | VH | VH | H |
| 19 | 1 | 26 | High speed rail uncertain | Elements of the design are affected by presumption that high speed rail (HSR) will actually service to facility (Note: high cost impact based upon opportunity cost of money invested in platform to be used by HSR and concourse spanning area to be used by HSR) | Concourse, platforms, canopies, escalators | Construction | VH | VH | H |
| 28 | 1 | 15 | MDT signoff predicated on current design and affected by changes | MDT may not approve possible changes to the design. | MDT bus hub and bus circulation, passenger circulation, architectural design | Construction, vehicular circulation | VH | VH | H |

# Idea Brainstorming

- Include consideration of ideas that will reduce risks to costs or schedule
- Consider ways to:
  - Avoid risks
  - Reduce risks
  - Transfer to others who can better control (but remember, the agency still pays for it somehow!)
  - Absorb (cover by contingency)
  - Combination of the above



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## Idea Analysis and Alternative Development

- Include ideas that survive and are validated as risk management plan input in value engineering recommendations
- Identify risks associated with adoption of VE recommendations



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# Value Engineering

## Value Engineering Results

- Generated 66 Ideas.
- Developed 39 VE Recommendations & Design Suggestions.
- VE Recommendations Identify Maximum Coincident Potential Cost Savings ~ $87 Million.
- Design Suggestions offer additional unquantifiable potential savings and mitigate risk.
- Identified 5 Areas for Further Cost Analyses.



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## Maximum Coincident Savings

| | |
|---|---|
| 1. Delete WC elevators & escalators | $ 5.04M |
| 3. Defer Center and East platforms and vertical access to Concourse | $36.96M |
| 6. Use 2 escalators with stairs vs. 4 escalators to each platform | $ 3.06M |
| 7. Eliminate escalator enclosures under canopies | $ 5.91M |
| 8. Platform canopies vs. train shed | $11.82M |
| 9. Create a mezzanine-level Concourse from Center platform to East Transportation Bldg. | $ 6.60M |
| 12. Reduce Concourse from 60' to 40' wide | $ 1.77M |
| 13. Use all steel framing vs. concrete/steel | $ 6.70M |
| 15. Use Vierindeel Truss for Concourse framing | $ 1.46M |
| 16. Use SS Mesh vs. glass curtainwall on Concourse | $ 0.41M |
| 17. Pre-purchase steel & erection now | $ 6.49M |
| 18. Delete LED lighting on escalator enclosures | $ 0.27M |
| 19. Delete canopy lighting between tracks | $ 0.06M |
| 20. Delete bike rack, wash, locker/toilet provisions | $ 0.45M |
| Total | $86.99M |



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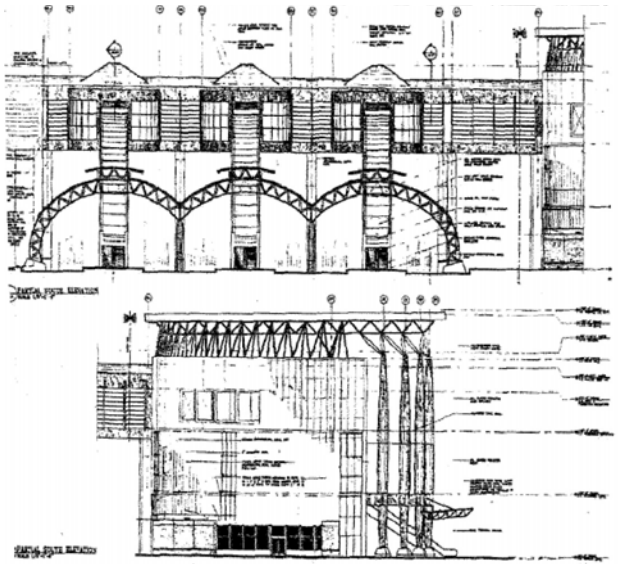
## Concourse Elevation





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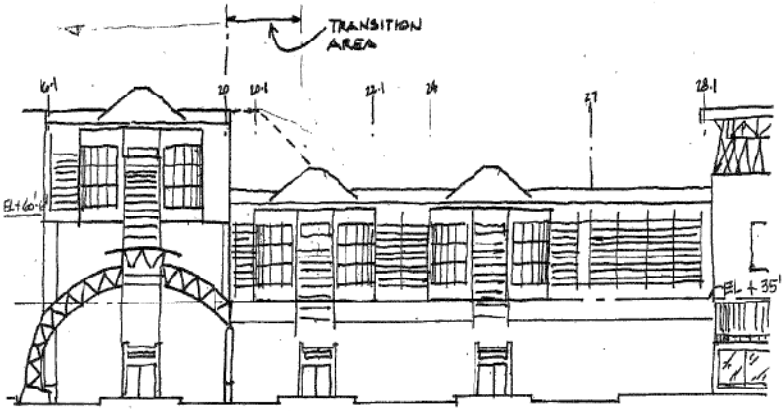
## Proposed Elevation




Mezzanine level bridge Proposal • SK 4/7.1



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## Risk Mitigation Design Suggestions

2. Relocate WC stair and foundation to avoid fouling Tri-Rail.
21. Re-evaluate Transportation Bldg space frame.
22. Simplify geometry of Transportation Bldg.
24. Re-evaluate column loadings to reduce foundations.
25. Define security parameters and responsibilities ASAP.
26. Emphasize/centralize police station location.
27. Put police station on 100% b/u power.
28. Selectively allow emergency use of elevators.
29. Increase generator fuel capacity for 28 hours operation.
30. Verify need for 125 hp fire pump.
35. Add mechanism to manage free parking.
36. Define ticketing schemes and add Tri-Rail ticketing at Concourse.
37. Define dynamic information system for various modes.
38. FDOT/CSXT execute force account agreement ASAP.
39. FDOT finalize recommendation to County for ownership/operations ASAP.



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## Further Cost Analyses

- Add Construction Contingency 10% - 15%
- Re-evaluate and extend current escalation from 3Q of 2009 to mid-point of construction 3Q of 2011.
- Add premium for MEP work >15’ above slab.
- Allocate funds for independent construction inspection and controlled inspection.
- Allocate funds for utility charges during construction; water, power



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## Questions?