# Duluth International Airport

**Director of Airports:** Brian Ryks  
**4701 Grinden Drive - Duluth International Airport**  
**Duluth, Minnesota 55811**

**FAA AIP No.** - 3-27-0024-51-11  
**RS&H Proj. No.** - 213.1882.110  
**City of Duluth Bid No.** - 11-4402

## Duluth Airport Authority Board of Directors

- President: John Eagleton
- Vice President: Robert Pearson
- Secretary: Michael Lundstrom
- Conrad Firling
- Roy Nieml
- Sue Ross
- Roger Wedin

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### New Passenger Terminal

**VALE Program Design**

**June 9, 2011**

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*Images of the Duluth International Airport and a diagram of the terminal.*

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**Architects and Civil Engineers:** REYNOLDS, SMITH & HILLS, INC.  
4525 Airport Approach Road, Duluth MN 55811  
TEL: (218) 722-1277 / FAX: (218) 722-1062

**M/E/P Design:** COSENTINI ASSOCIATES INC.  
1 South Dearborn Drive, 57th Floor, Chicago IL 60604  
TEL: (312) 201-7408 / FAX: (312) 201-6031

**Structural Engineers:** MJB Consulting Eng.  
501 Lake Avenue South, Suite 300, Duluth MN 55802  
TEL: (218) 722-1000 / FAX: (218) 722-2909

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**Construction Manager:** KRAUS-ANDERSON.  
3716 Drake Street  
Duluth MN 55807  
TEL: (218) 722-9778 / FAX: (218) 722-9778
DESIGN LOADS:

EXPANSION AND ADHESIVE ANCHORS:

TYPICAL NOTES:

Anchors in concrete or concrete masonry when not exposed to earth, weather, or corrosive environment materials shall comply with all the pertinent codes and references, plans, and details, including (but not limited to) those shown in architectural, civil, mechanical and electrical drawings.

Primary Frame Wind Data:

Expansion anchors shall be stud type with a single piece three section wedge and to indicate on shop drawings.

Primary Frame Wind Data:

Ground Snow Load, Pg: 60 psf
Flat-Roof Snow Load, Pf: 46 psf
Snow Exposure Factor, Ce: 0.70
Snow Load Importance Factor, I: 1.1
Unbalanced/Drift Snow Load: As required by ASCE 7

Refer to the specification for the existence, type, and thickness of interior ground vapor retarder. Locate a vapor general field conditions related to the new work, to the best of our knowledge. Report all discrepancies to the Architect for resolution prior to performing related new work.

Stair Tread Concentrated Load: 300 lbs

Splicing structural members where not detailed on the drawings is prohibited without prior approval of the structural engineer.

Provide concrete cover of minimum 1/2" to face shell. Refer to detail in the drawings for reinforcing bar lap lengths. Extend vertical reinforcing from footings to 2" clear top of wall or to beam bearing. Extend vertical reinforcing into the footings below utilities as required to avoid undermining of structure by utilities.

Contractor shall read and understand their duties in the specification and under the building code for special inspections and coordinate as necessary the owner's responsibilities.

For adhesive anchors refer to the product's ICBO Report.

For footings that do not bear on natural undisturbed soil, extend engineered fill laterally beyond bottom edge of footing for a distance equal to the depth of engineered fill. Reference drawings for details.

Cold-formed Light Gauge Metal Framing (Fy):

RC 2004 supplement.

Control Low 1,200 psi (at 5 days) Maximum

Phillips and girders had to be noted on top outriggers in the structural drawings. The outriggers that were noted on the structural drawings are not required on the outriggers in the structural drawings. Combining tension and slab 6" thick for the center spanning and slab 6" thick for the center spanning and slab 6" thick for the center spanning and slab 6" thick.

Stair stringers and railings shall be as indicated on the architectural drawings. Channel stringers to have a minimum 2" channel section. Vertical reinforcing in the Deck shall be extended into the concrete footing for at least 12". Vertical reinforcing is to be designed as required by the structural engineer.

Provide reinforcement or frames for deck openings as indicated on the drawings. Do not cut control joints in structural slabs on metal deck.

Activate all reinforcement shown in shop drawings. Refractory materials shall be placed around fireplaces, chimneys, and any other location of the building where fire resistance is required. Refer to the manufacturer's instructions for fire resistance installation requirements.

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Refer to drawings for non-composite steel floor deck fastening requirements. Powder actuated or pneumatically driven fasteners are not allowed.

Provide reinforcement or frames for deck openings as indicated on the drawings. Provide any necessary framing for concrete footings for beams and columns shown.

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Light gauge metal framing:

The design and connection detailing of all light gage material including, but not limited to exterior studs, bearing studs, headers, jambs, joists, rafters and anchorage shall be by the Light Gauge Supplier. The design for systems other than bearing framing must be in accordance with the following:

Studs shall be cold rolled steel, galvanized, C shape, with minimum 1 5/8" flange and minimum 1/2" top and bottom tracks shall be cold rolled or break formed steel, galvanized U shaped and minimum 5/8" wide.

Light gauge metal framing fasteners shall be minimum #10 self-drilling sheet metal screws, 16 threads per inch, with low profile head. Provide a minimum of two screws per connection unless noted otherwise.

Fasten light gage framing to wood with minimum #10 x 1 7/8" bugle head wood screws. Pre-drill holes in metal studs. Provide a minimum of two screws per connection unless noted otherwise.

At all wall elements, provide 1 1/2"-16 gauge horizontal channel bridging to prevent stud rotation. For all axial loaded walls, space bridging at 4'-0" OC. For all non-load bearing exterior walls, space bridging at 5'-0" OC.

Structural Engineers:

MBJ Consulting Eng.
501 Lake Avenue South, Suite 300, Duluth MN 55802
TEL: (218) 722-1056 / FAX: (218) 722-9306

For wall studs providing lateral support to masonry veneer and cementitious stucco, provide L/600. For wall studs providing lateral support to other materials, provide L/360.

AEP Project Number: AEP-003
M/E/P/FP Engineers:

Consentini Associates Inc.
TEL: (312) 201-7408 / FAX: (312) 201-0031

Live Load Deflection is L/360. Total Load Deflection is L/240. An additional joist shall be provided under parallel non-load bearing partition walls.

The light gauge supplier shall submit certified shop drawings and design calculations prepared by a qualified Professional Engineer registered in the state of Minnesota. See project specification manual for additional submittal requirements.

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SPECIAL INSPECTION SCHEDULE:

**SPECIAL INSPECTION REQUIREMENTS OF STRUCTURAL ELEMENTS PER IBC 2006 (CHAPTER 17):**

<table>
<thead>
<tr>
<th>SHEET TITLE</th>
<th>SHEET NUMBER</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECIAL INSPECTION SCHEDULE</td>
<td>S003</td>
<td>VALE PROGRAM BID PACKAGE</td>
</tr>
</tbody>
</table>

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Revised October 2006

Duluth, Minnesota 55811

www.rsandh.com

VALE PROGRAM

DULUTH INTERNATIONAL AIRPORT
DULUTH, MN
NEW PASSENGER TERMINAL

CONSULTANTS

MJI Consulting Engineers

COSENTINI ASSOCIATES INC.

MBJ Consulting Engineers

GENERAL STRUCTURAL NOTES

S003

VALE PROGRAM BID PACKAGE
1. Beam Design includes 40 PSF hanging load allowance.


3. Verify exact size, location and quantity of required openings through the Framing Plan. Coordinate required openings with all trades that require them. Minor openings are not shown on structural drawings.

4. See Plan and Schedules for column, wall and pier information.

5. Headed studs on Plan are thus: 3/4" diameter x 0'-5" long. See general.

6. * on Plan indicates dimension to be verified by the contractor with the architect or engineer.

7. W8 "Steel Safety Beam" designed using recommended 5,000 pound net live load per Otis Drawing No. AAA 28020BD (no date). Top of beam elevation to be coordinated with required elevator clear height. Bear on Bearing Plate 1/2" x 8" x 0'-8" with 3/4" diameter x 4" long HSA each end over fully grouted cell. Verify safety beam requirements with elevator supplier prior to fabrication.

8. Roof Level Framing Plan - Area A

ROOF LEVEL FRAMING PLAN - AREA A
1. ALL SOLAR PANEL SUPPORT STEEL TO BE GALVANIZED.
### Horizontal Type Unit Heaters Schedule

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Type</th>
<th>HP</th>
<th>BHP</th>
<th>Motor HP</th>
<th>RPM</th>
<th>CFM</th>
<th>W/</th>
<th>V/Ph/Hz</th>
<th>MANUF. &amp; REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF-3.5</td>
<td>MECH RM #333</td>
<td>2000</td>
<td>0.25</td>
<td>PROP DIRECT</td>
<td>1100</td>
<td>350</td>
<td>6</td>
<td>208/3/60</td>
<td>TWIN CITY 161A TCPE 1, 2, 6 W/ VFD</td>
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</tbody>
</table>

1. PROVIDE LINE VOLTAGE THERMOSTAT AND NON-FUSED DISCONNECT.

2. PROVIDE OSHA BELT & MOTOR GUARD.

5. PROVIDE EXPLOSION PROOF MOTOR.

6. PROVIDE WALL SLEEVE W/ MOTORIZED DAMPER ON DRAWINGS.

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### Expansion Tank Schedule

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Type</th>
<th>HP</th>
<th>BHP</th>
<th>Motor HP</th>
<th>RPM</th>
<th>CFM</th>
<th>W/</th>
<th>V/Ph/Hz</th>
<th>MANUF. &amp; REMARKS</th>
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</thead>
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<tr>
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### Water to Water Non-Reversible Heat Pump Chiller Schedule

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<th>Type</th>
<th>HP</th>
<th>BHP</th>
<th>Motor HP</th>
<th>RPM</th>
<th>CFM</th>
<th>W/</th>
<th>V/Ph/Hz</th>
<th>MANUF. &amp; REMARKS</th>
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### Pumps Schedule

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<th>Type</th>
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<th>BHP</th>
<th>Motor HP</th>
<th>RPM</th>
<th>CFM</th>
<th>W/</th>
<th>V/Ph/Hz</th>
<th>MANUF. &amp; REMARKS</th>
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</thead>
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### Fan Schedule

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<th>Type</th>
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<th>BHP</th>
<th>Motor HP</th>
<th>RPM</th>
<th>CFM</th>
<th>W/</th>
<th>V/Ph/Hz</th>
<th>MANUF. &amp; REMARKS</th>
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</thead>
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<td></td>
</tr>
</tbody>
</table>

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**Notes:**
- Provide line voltage thermostat and non-fused disconnect.
- Provide OSHA belt and motor guard.
- Provide explosion proof motor.
- Provide wall sleeve with motorized damper on drawings.
**PANEL DISTRIBUTION: DP-1A (EX. PNL)**

<table>
<thead>
<tr>
<th>No</th>
<th>Item Description</th>
<th>Current (A)</th>
<th>Voltage (V)</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>CB</td>
<td>76.0</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PC AIR-GATE #3</td>
<td>111.0</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PC AIR-GATE #4</td>
<td>76.0</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>400Hz PWR UNIT-GATE #4</td>
<td>111.0</td>
<td>480</td>
<td>150</td>
</tr>
<tr>
<td>5</td>
<td>SPARE</td>
<td>200</td>
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**PANEL DISTRIBUTION: DP-2A (NEW PNL)**

<table>
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<th>Current (A)</th>
<th>Voltage (V)</th>
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<tbody>
<tr>
<td>1</td>
<td>CB</td>
<td>93.0</td>
<td>480</td>
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</tr>
<tr>
<td>2</td>
<td>XMFR &quot;T-1B&quot;</td>
<td>189.0</td>
<td>480</td>
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</tr>
<tr>
<td>3</td>
<td>PNL &quot;PP-1A&quot;</td>
<td>91.0</td>
<td>480</td>
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</tr>
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<td>4</td>
<td>PC AIR-GATE #1</td>
<td>116.0</td>
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<tr>
<td>5</td>
<td>400Hz PWR UNIT-GATE #1</td>
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<td>6</td>
<td>PC AIR-GATE #2</td>
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<td>7</td>
<td>400Hz PWR UNIT-GATE #1</td>
<td>111.0</td>
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<td>150</td>
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**SWGR DISTRIBUTION: MSG-1A W/TVSS**

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<th>Remarks</th>
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<tbody>
<tr>
<td>1</td>
<td>SWITCHBOARD &quot;SB-3&quot;</td>
<td>1038.0</td>
<td>480</td>
<td>2000</td>
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<tr>
<td>2</td>
<td>&quot;ATS-1&quot; (EM LTG)</td>
<td>23.0</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PNL &quot;DP-2A&quot;</td>
<td>374.0</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>PNL &quot;DP-ELEV&quot;</td>
<td>99.0</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>SPARE</td>
<td>800</td>
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</table>

**SWGR DISTRIBUTION: MSG-1B W/TVSS**

<table>
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<tr>
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<th>Item Description</th>
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<th>Voltage (V)</th>
<th>Remarks</th>
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<tbody>
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<td>787.0</td>
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<td>1200</td>
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<tr>
<td>2</td>
<td>&quot;ATS-4&quot; (CRITICAL)</td>
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<td>1200</td>
</tr>
<tr>
<td>3</td>
<td>&quot;ATS-3&quot; (CRITICAL)</td>
<td>134.0</td>
<td>480</td>
<td>350</td>
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<tr>
<td>4</td>
<td>PNL &quot;LDP-1A&quot;</td>
<td>81.0</td>
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<td>400</td>
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<tr>
<td>5</td>
<td>SPARE</td>
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</tbody>
</table>
**DRAWING SYMBOLS**

- FIRE PROTECTION SYMBOLS
  - **Symbol**: [Diagram of symbols]

- FIRE PROTECTION ABBREVIATIONS
  - **Abbreviation**: [List of abbreviations]

**DULUTH INTERNATIONAL AIRPORT**

**5528 FIRE PROTECTION DRAWING LIST**

**GENERAL NOTES**:

- Do not use the following symbols and abbreviations until the official symbol list is established.
- Do not use any of the symbols that are not officially recognized.
- Symbol sizes should be properly established in all engineering drawings and as specified by the code.
- Where applicable, only symbols that are officially recognized shall be used in the drawings.
- The code shall not include any symbol unless it is approved by the code authorities.
- Do not use any symbol not approved by the appropriate code agencies.