City of Aurora
Building Codes Division
15151 E Alameda Pkwy
Aurora, CO 80012
(303) 739-7420

Notice

This material is subject to copyright protection pursuant to Federal Law: 17 United States Code Section 106.

COM*check* Software Version 3.5.2
Interior Lighting Compliance Certificate

2006 IECC

Report Date: 04/14/09

Data filename: F:\2009 Projects\809012 Aurora Cath Labs\Engineering\Electrical\Load Calculations\Aurora Cath Lab.cck

Section 1: Project Information

Project Type: **Addition**

Project Title : Aurora Cath Lab Addition

Construction Site:
1501 S. Potomac St
Aurora, CO 80012

Owner/Agent:

Designer/Contractor:
Tyler Fritz
ccrd partners
8301 E. Prentice Ave
Suite 200
Greenwood Village, CO 80111
303.694.4755

Section 2: General Information

Building Use Description by: **Activity Type**

Activity Type(s)	Floor Area
Hospital	4535

Section 3: Requirements Checklist

Interior Lighting:

☑ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
5442	5389	YES

Controls, Switching, and Wiring:

☑ 2. Independent controls for each space (switch/occupancy sensor).
Exceptions:

Areas designated as security or emergency areas that must be continuously illuminated.

Lighting in stairways or corridors that are elements of the means of egress.

N/A ☐ 3. Master switch at entry to hotel/motel guest room.

N/A ☐ 4. Individual dwelling units separately metered.

☑ 5. Each space provided with a manual control to provide uniform light reduction by at least 50%.
Exceptions:

Only one luminaire in space;

An occupant-sensing device controls the area;

The area is a corridor, storeroom, restroom, public lobby or sleeping unit.

Areas that use less than 0.6 Watts/sq.ft.

09-387421

☑ 6. Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.
Exceptions:

Sleeping units, patient care areas; and spaces where automatic shutoff would endanger safety or security.

N/A ☐ 7. Photocell/astronomical time switch on exterior lights.
Exceptions:

Lighting intended for 24 hour use.

☑ 8. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).
Exceptions:

Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.

Section 4: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2006 IECC requirements in COM*check* Version 3.5.2 and to comply with the mandatory requirements in the Requirements Checklist.

Tyler Fritz, Electrical Designer		04.14.09
Name - Title	Signature	Date

09-387421

COMcheck Software Version 3.5.2

Interior Lighting Application Worksheet

2006 IECC

Report Date:

Data filename: F:\2009 Projects\809012 Aurora Cath Labs\Engineering\Electrical\Load Calculations\Aurora Cath Lab.cck

Section 1: Allowed Lighting Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Hospital	4535	1.2	5442
		Total Allowed Watts =	5442

Section 2: Proposed Lighting Power Calculation

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Hospital (4535 sq.ft.)				
Linear Fluorescent 1: A1: 2x4 D/I / 48" T8 32W / Electronic	2	9	59	531
Linear Fluorescent 2: B2: 2x4 LENSED / 48" T8 32W / Electronic	1	5	30	150
Linear Fluorescent 3: A2: 2x4 D/I / 48" T8 32W / Electronic	3	4	86	344
Compact Fluorescent 1: C1/C2/C3: 6" DOWNLIGHT / Triple 4-pin 26W / Electronic	1	16	26	416
Linear Fluorescent 5: A3: 2X2 D/I / 24" T8 17W / Electronic	2	1	30	30
Linear Fluorescent 6: H1: 4' U/C / 46" T5 28W / Electronic	1	4	32	128
Linear Fluorescent 7: H1: 3' U/C / 35" T5 21W / Electronic	1	6	25	150
Linear Fluorescent 8: B3: 2X2 LENSED / 24" T8 17W / Electronic	3	16	51	816
Linear Fluorescent 9: H1: 2' U/C / 22" T5 14W / Electronic	1	3	17	51
Linear Fluorescent 10: EX: STRIP / 48" T8 32W / Electronic	2	3	59	177
Linear Fluorescent 11: B5: 2X4 LENSED / 48" T8 32W / Electronic	4	22	118	2596
			Total Proposed Watts =	5389

Section 3: Compliance Calculation

If the Total Allowed Watts minus the Total Proposed Watts is greater than or equal to zero, the building complies.

Total Allowed Watts =	5442
Total Proposed Watts =	5389
Project Compliance =	53

Interior Lighting PASSES: Design 1% better than code.

09-387421

********** FAULT ANALYSIS SUMMARY **********

BUS NAME	VOLTAGE L-L	AVAILABLE FAULT CURRENT 3 PHASE	X/R	LINE/GRND	X/R
B- EQ	480.	42827.4	3.7	0.04	1.0
B-1CRH	480.	7377.8	0.4	0.04	1.0
B-1CRLA	208.	3244.4	0.8	2938.21	0.8
B-1CRLB	208.	2992.1	0.7	2691.88	0.7
B-1DPCRH	480.	60132.6	4.3	0.04	1.0
B-1DPEQH	480.	60982.2	4.2	0.04	1.0
B-1DPLSH	480.	46034.3	1.5	0.04	1.0
B-1DPNH	480.	62993.0	4.9	0.04	1.0
B-1DPNL	208.	6474.1	1.5	6532.57	1.4
B-1EQDPHA	480.	10930.0	1.4	0.04	1.0
B-1NHA	480.	7555.3	0.4	0.04	1.0
B-1NHB	480.	47353.9	1.6	0.04	1.0
B-1NLA	208.	2717.6	0.7	2356.71	0.7
B-1NLB	208.	6046.8	1.3	5981.27	1.3
B-2CRH	480.	10859.1	0.5	0.04	1.0
B-2CRLA	208.	5618.3	1.3	5728.36	1.3
B-2DPCRL	208.	5928.2	1.3	6151.59	1.4
B-2DPEQH	480.	21811.3	1.0	0.04	1.0
B-2EQL	208.	1755.3	0.5	1795.15	0.5
B-2LSH	480.	10720.3	0.5	0.04	1.0
B-2LSL	208.	1750.7	0.5	1787.55	0.5
B-2NH	480.	12225.3	0.5	0.04	1.0
B-2NLA	208.	3650.7	0.8	3266.12	0.8
B-3CRH	480.	9901.8	0.4	0.04	1.0
B-3CRLA	208.	5147.9	1.1	5114.48	1.1
B-3CRLB	208.	5333.5	1.2	5352.62	1.2
B-3NH	480.	11100.2	0.5	0.04	1.0
B-3NLA	208.	3451.2	0.8	3066.06	0.8
B-3NLB	208.	3426.2	0.8	3041.16	0.8
B-4CRH	480.	9098.3	0.4	0.04	1.0
B-4CRLA	208.	5515.6	1.2	5656.81	1.2
B-4DPCRL	208.	5815.3	1.3	6070.34	1.4
B-4DPNL	208.	5828.1	1.3	6079.65	1.4
B-4NH	480.	10101.7	0.4	0.04	1.0
B-4NLA	208.	3085.4	0.7	2789.50	0.7
B-5CRH	480.	8414.5	0.4	0.04	1.0

09-387421

********** FAULT ANALYSIS SUMMARY **********

BUS NAME	VOLTAGE L-L	AVAILABLE FAULT CURRENT 3 PHASE	X/R	LINE/GRND	X/R
B-NHDP	480.	13221.1	1.1	0.04	1.0
B-NLAB	208.	2055.3	0.5	1757.43	0.5
CATH	480.	8194.4	0.3	0.04	1.0

********** FAULT ANALYSIS REPORT COMPLETED **********

09-387421

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Structural steel framing members, support members.

B. Base plates, shear stud connectors.

C. Grouting under base plates.

1.2 RELATED SECTIONS

A. Section 05 31 00 - Steel Decking: Support framing for small openings in deck.

1.3 UNIT PRICES - MEASUREMENT AND PAYMENT

A. See Section 01 22 00 - Unit Prices, for additional unit price requirements.

B. Structural Steel Framing:
   1. Basis of Measurement: By the ton (metric ton).
   2. Basis of Payment: Includes structural members fabricated, placed and anchored.

1.4 REFERENCES

A. AISC (AMAN) - ASD Manual of Steel Construction; American Institute of Steel Construction, Inc.; 1989, Ninth Edition.

B. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc.; 2005.

C. AISC S348 - Specification for Structural Joints Using ASTM A325 or A490 Bolts; 2004.

D. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2005.

E. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2004a.

F. ASTM A 108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2003.

G. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 2004.

H. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2004b.

I. ASTM A 490 - Standard Specification for Structural Bolts, Alloy Steel, Heat-Treated, 150 ksi Minimum Tensile Strength; 2004a.

J. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2003a.

K. ASTM A 563 - Standard Specification for Carbon and Alloy Steel Nuts; 2004a.

09 -387421

L. ASTM A 588/A 588M - Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4-in. (100-mm) Thick; 2004.

M. ASTM A 992/A 992M - Standard Specification for Structural Steel Shapes; 2004a.

N. ASTM C 1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2002.

O. ASTM E 94 - Standard Guide for Radiographic Examination; 2004.

P. ASTM E 164 - Standard Practice for Ultrasonic Contact Examination of Weldments; 2003.

Q. ASTM E 165 - Standard Test Method for Liquid Penetrant Examination; 2002.

R. ASTM E 709 - Standard Guide for Magnetic Particle Examination; 2001.

S. ASTM F 436 - Standard Specification for Hardened Steel Washers; 2004.

T. ASTM F 959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners; 2005.

U. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 1998.

V. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2004 and errata.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
2. Connections not detailed.
3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

D. Mill Test Reports: Indicate structural strength, destructive test analysis and non-destructive test analysis.

E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.6 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC "ASD Manual of Steel Construction".

B. Comply with Section 10 of AISC "Code of Standard Practice for Steel Buildings and Bridges" for architecturally exposed structural steel.

C. Maintain one copy of each document on site.

09 -387421

D. Fabricator: Company specializing in performing the work of this section with minimum 10 years of documented experience.

E. Erector: Company specializing in performing the work of this section with minimum 10 years of documented experience.

F. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.1 MATERIALS

A. Steel Angles, Plates, Channels, and S Shapes: ASTM A 36/A 36M.

B. Steel W Shapes and Tees: ASTM A 992/A 992M.

C. Rolled Steel Structural Shapes: ASTM A 992/A 992M.

D. Cold-Formed Structural Tubing: ASTM A 500, Grade B.

E. Pipe: ASTM A 53/A 53M, Grade B, Finish black.

F. Shear Stud Connectors: Made from ASTM A 108 Grade 1015 bars.

G. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, medium carbon, galvanized.

H. High-Strength Structural Bolts: ASTM A 490 (ASTM A 490M), with matching ASTM A 563 (ASTM A 563M) nuts and ASTM F 436 washers; Type 1 alloy steel.

I. Anchor Bolts: ASTM A 307, Grade C.

J. High-Strength Anchor Bolts: ASTM A 325, Type 1 medium carbon, plain.

K. Load Indicator Washers: Provide washers complying with ASTM F 959 at all connections requiring high-strength bolts.

L. Welding Materials: AWS D1.1; type required for materials being welded.

M. Sliding Bearing Plates: Teflon coated.

N. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C 1107 and capable of developing a minimum compressive strength of 7,000 psi (48 MPa) at 28 days.

O. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

P. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.2 FABRICATION

A. Shop fabricate to greatest extent possible.

B. Fabricate connections for bolt, nut, and washer connectors.

C. Develop required camber for members.

09 -387421

2.3 FINISH

A. Prepare structural component surfaces in accordance with SSPC SP _2 unless required otherwise for compatibility with shop and field primers and fireproofing.

B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.

2.4 SOURCE QUALITY CONTROL AND TESTS

A. Provide shop testing and analysis of structural steel.

B. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts", testing at least 10 percent of bolts at each connection.

C. Welded Connections: Visually inspect all shop-welded connections and test at least 10 percent of welds using one of the following:
1. Radiographic testing performed in accordance with ASTM E 94.
2. Ultrasonic testing performed in accordance with ASTM E 164.
3. Liquid penetrant inspection performed in accordance with ASTM E 165.
4. Magnetic particle inspection performed in accordance with ASTM E 709.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.2 ERECTION

A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges".

B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Field weld components indicated on shop drawings.

D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".

E. Do not field cut or alter structural members without approval of Architect.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.3 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

09 -387421

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

3.4 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.

B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts", testing at least 10 percent of bolts at each connection.

C. Welded Connections: Visually inspect all field-welded connections and test at least 10 percent of welds using one of the following:
   1. Radiographic testing performed in accordance with ASTM E 94.
   2. Ultrasonic testing performed in accordance with ASTM E 164.
   3. Liquid penetrant inspection performed in accordance with ASTM E 165.
   4. Magnetic particle inspection performed in accordance with ASTM E 709.

END OF SECTION

09 -387421

CATH LAB AIR BALANCE SCHEDULE

ROOM	ROOM NAME	SQUARE FEET	CEILING HEIGHT (FEET)	PRESSURE	OUTSIDE AIR AIR CHANGES	MINIMUM OUTSIDE AIR REQUIRED	OUTSIDE AIR PROVIDED	SUPPLY AIR AIR CHANGES	COOLING CFM REQUIRED	SUPPLY CFM PROVIDED	EXHAUST AIR CHANGES	EXHAUST CFM REQUIRED	EXHAUST CFM PROVIDED	RETURN CFM PROVIDED
1098	CORRIDOR	1044	8.5	NEUTRAL	0	0	240	2	296	1200		0		1200
1097A	CATH LAB 1	548	9	POSITIVE	3	247	434	25	2055	2170		0		2040
1097B	CATH LAB 2	565	9	POSITIVE	3	254	448	25	2119	2240		0		2090
1097C	EQUIPMENT	80	8	NEUTRAL	0	0	200	4	43	1000		0		1000
1097D	CONTROL	103	8	NEUTRAL	2	27	50	6	82	250		0		250
1097E	EQUIPMENT	84	8	NEUTRAL	0	0	200	4	45	1000		0		1000
1097F	CONTROL	103	8	NEUTRAL	2	27	50	6	82	250		0		250
1100	SOILED UTILITY	120	8	**NEGATIVE**	0	0	36	0	0	180	10	160	300	0
1101	EQUIPMENT STORAGE	114	8	POSITIVE	0	0	15	4	61	75		0		50
1102	EXISTING MICROBIOLOGY AND OFFICE	891	8	**NEGATIVE**	0	0	398	6	713	1990		0	2000	190 - FOR OFFICE
1103	CLEAN UTILITY/POU	135	8	POSITIVE	0	0	40	4	72	200		0		190
1104	UPS	90	12	NEUTRAL	0	0	0	0	0	1260		0		1260
1105	STAFF LOUNGE	289	8	NEUTRAL	0	0	120	4	154	600		0		600
1108	LOCKER ROOM	74	8	NEUTRAL	0	0	40	8	79	200		0	200	0
1109	STAFF TOILET/SHOWER	93	8	**NEGATIVE**	0	0	15	0	0	75	10	124	150	0
1110	PATIENT TOILET	74	8	**NEGATIVE**	0	0	22	0	0	110	10	99	150	0
1111	JANITOR	37	12	NEUTRAL	0	0	15	0	0	75	10	74	75	0
1112	MEDS	64	8	POSITIVE	0	0	15	4	34	75		0		50
1113	NURSE STATION	171	8.5	NEUTRAL	2	48	55	6	145	275		0		275
1114	PREP AND RECOVERY	460	8.5	NEUTRAL	2	130	138	6	391	690		0		690

09 -387421