

MANUFACTURER:
DESIGN SPACE, INC.

APPENDIX B

SERIAL No: BUILDING CODE SUMMARY
14371 A/F FOR ALL COMMERCIAL PROJECTS

KAG No: (EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)
052404PSI (Reproduce the following data on the building plans sheet 1 or 2)

Name of Project: Gospel Tabernacle Hispanic Church
 Address: 2291 N.C. ST EAST
 Proposed Use: _____
 Owner or Authorized Agent: _____ Phone # _____
 Owned By: City/County Private State
 Code Enforcement Jurisdiction: City RALEIGH County

LEAD DESIGN PROFESSIONAL: KENNETH A. GODFREY, P.E. (FACTORY BUILT PORTION OF PROJECT)

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #
Architectural	_____	_____	_____	() _____
Civil	_____	_____	_____	() _____
Electrical	_____	_____	_____	() _____
Fire Alarm	_____	_____	_____	() _____
Plumbing	_____	_____	_____	() _____
Mechanical	_____	_____	_____	() _____
Sprinkler-Standpipe	_____	_____	_____	() _____
Structural	<u>KENNETH A. GODFREY</u>	<u>KENNETH A. GODFREY</u>	<u>18282</u>	<u>(727) 799-0718</u>
Retaining Walls >5' High	_____	_____	_____	() _____
Other:	_____	_____	_____	() _____

YEAR EDITION OF CODE: 2002
 New Construction Renovation (Existing Bldg) Upfit Alteration

BUILDING DATA
 Construction Type: I-A I-B II-A II-B III-A III-B
 IV V-A V-B
 Mixed construction: No Yes Types _____
 Sprinklers: No Yes NFPA 13 NFPA 13R NFPA 13D
 Standpipes: No Yes Class I II III Wet Dry
 Fire District: No Yes
 Building Height: 14 Feet 1 Number of Stories Unlimited per _____
 Mezzanine: No Yes
 High Rise: No Yes Central Reference Sheet # (if provided) _____
 Gross Building Area:

MAY 25 2004

FLOOR	EXISTING (SQ FT)	NEW (SQ FT)	SUB-TOTAL
6 th Floor			
5 th Floor			
4 th Floor			
3 rd Floor			
2 nd Floor			
Mezzanine			
1 st Floor		<u>4920</u>	<u>4920</u>
Basement			
TOTAL			

ALLOWABLE AREA

Primary Occupancy: Assembly A-1 A-2 A-3 A-4 A-5
 Business Educational Factory-Industrial F-1 F-2 F-3
 High-Hazard H-1 H-2 H-3 H-4 H-5
 Institutional I-1 I-2 I-3 I-4
 I-3 Use Condition 1 2 3 4 5
 Mercantile Residential R-1 R-2 R-3 R-4
 Storage S-1 S-2 High-piled
 Utility and Miscellaneous Parking Garage Open Enclosed Repair

Secondary Occupancy:

Special Occupancy: 508.2 508.3 508.4 508.5 508.6 508.7 508.8

Mixed Occupancy: No Yes Separation: _____ Hr. Exception: _____

Non-Separated Mixed Occupancy (303.1 Exception)

The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.

Separated Mixed Occupancy (303.1/303.2) - See below for area calculations

For each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

_____ + _____ + _____ = _____ ≤ 1.00

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 503 AREA	(C) AREA FOR OPEN SPACE INCREASE	(D) AREA FOR SPRINKLER INCREASE	(E) ALLOWABLE AREA OR UNLIMITED	(F) MAXIMUM BUILDING AREA
1	E	4920	9500			9500	9500

Open space area increases from Section 506.2 are computed thus:

- Perimeter which fronts a public way or open space having 20 feet minimum width = _____ (F)
- Total Building Perimeter = _____ (P)
- Ratio (F/P) = _____ (F/P)
- W = Minimum width of public way = _____ (W)
- Percent of frontage increase $I_r = 100 [F/P - 0.25] \times W/30 = \text{_____} (\%)$

The sprinkler increase per Section 506.3 is as follows:

- Multi-story building $I_s = 200$ percent
- Single story building $I_s = 300$ percent

Unlimited area applicable under conditions of Sections Group B, F, M, S, A-4 (507.1, 507.2, 507.3, 507.5); Group A motion picture (507.8); Malls (402.6); and H-2 aircraft paint hangers (507.6).

Maximum Building Area = total number of stories in the building x E but not greater than 3 x E.

The maximum area of parking garages must comply with 406.3.5. The maximum area of air traffic control towers must comply with 412.1.2.

ALLOWABLE HEIGHT

	ALLOWABLE (TABLE 503)	INCREASE FOR S/PINKLERS	SHOWN ON PLANS	CODE REFERENCE
Type of Construction	Type <u>V-B</u>		Type <u>V-B</u>	
Building Height in Feet	Feet <u>40</u>	Feet = H + 20' =	<u>14</u>	
Building Height in Stories	Stories <u>1</u>	Stories + 1 =	Stories <u>1</u>	

FIRE PROTECTION REQUIREMENTS

Life Safety Plan Sheet #, if Provided _____

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING		DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENETRATION	DESIGN # FOR RATED JOINTS
		REQ'D	PROVIDED (w/ REDUCTION)				
Structural frame, including columns, girders, trusses	30	0	0				
Bearing walls	30	0	0				
Exterior							
North							
East							
West							
South							
Interior							
Nonbearing walls and partitions							
Exterior	30	0	0				
North							
East							
West							
South							
Interior							
Floor construction Including supporting beams and joists	30	0	0				
Roof construction Including supporting beams and joists	30	0	0				
Shafts - Exit	N/A						
Shafts - Other	N/A						
Corridor Separation	30	1	1				
Occupancy Separation	N/A						
Party/Fire Wall Separation	N/A						
Smoke Barrier Separation	N/A						
Tenant Separation	N/A						

* Indicate section number permitting reduction

LIFE SAFETY SYSTEM REQUIREMENTS

- Emergency Lighting: No Yes
- Exit Signs: No Yes
- Fire Alarm: No Yes
- Smoke Detection Systems: No Yes
- Panic Hardware: No Yes

EXIT REQUIREMENTS

NUMBER AND ARRANGEMENT OF EXITS

FLOOR, ROOM OR SPACE DESIGNATION	MINIMUM NUMBER OF EXITS		TRAVEL DISTANCE		ARRANGEMENT MEANS OF EGRESS (SECTION 1004.1)	
	REQUIRED	SHOWN ON PLANS	ALLOWABLE TRAVEL DISTANCE (TABLE 1004.2.4)	ACTUAL TRAVEL DISTANCE SHOWN ON PLANS	REQUIRED DISTANCE BETWEEN EXIT DOORS	ACTUAL DISTANCE SHOWN ON PLANS
1 st FLOOR	2	2	200'	71'	51'	82'

- ¹ Corridor dead ends (Section 1004.3.2.3)
- ² Single exits (Table 1005.2.2)
- ³ Common Path of Travel (Section 1004.2.5)

EXIT WIDTH

USE GROUP OR SPACE DESCRIPTION	(a) AREA sq. ft.	(b) AREA PER OCCUPANT (TABLE 1003.2.2)	(c) EXIT WIDTH (d)					
			EGRESS WIDTH PER OCCUPANT (TABLE 1003.2.3)		REQUIRED WIDTH (SECTION 1003.2.3)		ACTUAL WIDTH SHOWN ON PLANS	
			STAIR	LEVEL	STAIR	LEVEL	STAIR	LEVEL
CLASSROOMS	4134	20	0.3	0.2	62	42	N/A	34 x 4

- ¹ See Table 1003.2.2.2 to determine whether net or gross area is applicable. See definition "Area, Gross" and "Area, Net" (Section 1002)
- ² The sprinkler increase per Section 506.3 is as follows:
 - c. Multi-story building I_s = 200 percent
 - d. Single story building I_s = 300 percent
- ³ Minimum stairway width (Section 1003.3.3); min. corridor width (Section 1004.3.2.2); min. door width (Section 1003.3.1)
- ⁴ Minimum width of exit passageway (Section 1005.3.3)
- ⁵ The loss of one means of egress shall not reduce the available capacity to less than 50 percent of the total required (Section 1003.2.3)
- ⁶ Assembly occupancies (Section 1008)

STRUCTURAL DESIGN

DESIGN LOADS:

Importance Factors: Wind (I_w) 1.0
 Snow (I_s) 1.0
 Seismic (I_e) 1.0

Live Loads: Roof 20 psf
 Mezzanine N/A psf
 Floor 40 psf

Snow Load: 20 psf

Wind Load: Basic Wind Speed 120 mph (ASCE-7-98)
 Exposure Category C
 Wind Base Shears (for MWFRS) $V_x = 22.4^k$ $V_y = 20.0^k$

SEISMIC DESIGN CATEGORY A

Compliance with Section 1616.4 only? Yes No

SEISMIC DESIGN CATEGORY B, C, & D

Provide the following Seismic Design Parameters:

Seismic Use Group 1
 Spectral Response Acceleration S_{MS} 73 %g S_{M1} 28 %g
 Site Classification D

Basic structural system (check one)

- Bearing Wall
- Building Frame
- Moment Frame
- Dual w/Special Moment Frame
- Dual w/Intermediate R/C or Special Steel
- Inverted Pendulum

Seismic base shear $V_x = 12^k$ $V_y = 12^k$
 Analysis Procedure Simplified Equivalent Lateral Force Modal
 Architectural, Mechanical, Components anchored?

LATERAL DESIGN CONTROL: Earthquake Wind

SOIL BEARING CAPACITIES:

Field Test (provide copy of test report) _____ psf
 Presumptive Bearing capacity 2000 psf
 Pile size, type, and capacity _____

PLUMBING FIXTURE REQUIREMENTS

ON SITE BY OTHERS

OCCUPANCY	WATER CLOSETS		URINALS	LAVATORIES		SHOWERS	DRINKING FOUNTAINS	
	MALE	FEMALE		MALE	FEMALE	TUBS	REGULAR	ACCESSIBLE

ACCESSIBLE PARKING

ON SITE BY OTHERS

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES		# OF ACCESSIBLE SPACES PROVIDED		TOTAL # OF ACCESSIBLE SPACES PROVIDED
	REQUIRED	PROVIDED	REGULAR WITH 5' ACCESS AISLE	VAN SPACES WITH 8' ACCESS AISLE	
TOTAL					

SPECIAL APPROVALS

Special approval: (Local Jurisdiction, Department of Insurance, SBCCI, ICC, etc., describe below)

DEPARTMENT OF INSURANCE - MODULAR CONSTRUCTION

ENERGY SUMMARY

ENERGY REQUIREMENTS:

The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If energy cost budget method, state the annual energy cost budget vs allowable annual energy cost budget.

THERMAL ENVELOPE

Method of Compliance:

Prescriptive Performance Energy Cost Budget

Roof/ceiling Assembly (each assembly)

Description of assembly
 U-Value of total assembly
 R-Value of insulation
 Skylights in each assembly
 U-Value of skylight
 total square footage of skylights in each assembly

Exterior Walls (each assembly)

Description of assembly
 U-Value of total assembly
 R-Value of insulation
 Openings (windows or doors with glazing)
 U-Value of assembly
 shading coefficient
 projection factor
 low e required, if applicable
 Door R-Values

Walls adjacent to unconditioned space (each assembly)

Description of assembly
 U-Value of total assembly
 R-Value of insulation
 Openings (windows or doors with glazing)
 U-Value of assembly
 Low e required, if applicable
 Door R-Values

Walls below grade (each assembly)

Description of assembly
 U-Value of total assembly
 R-Value of insulation

Floors over unconditioned space (each assembly)

Description of assembly
U-Value of total assembly
R-Value of insulation

Floors slab on grade

Description of assembly
U-Value of total assembly
R-Value of insulation
Horizontal/vertical requirement
slab heated

ELECTRICAL SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

Method of Compliance:

Prescriptive Performance Energy Cost Budget

Lighting schedule

lamp type required in fixture
number of lamps in fixture
ballast type used in the fixture
number of ballasts in fixture
total wattage per fixture
total interior wattage specified vs allowed
total exterior wattage specified vs allowed

Equipment schedules with motors (not used for mechanical systems)

motor horsepower
number of phases
minimum efficiency
motor type
of poles

MECHANICAL SUMMARY

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

Method of Compliance

Prescriptive Energy Cost Budget

Thermal Zone

winter dry bulb
summer dry bulb

Interior design conditions

winter dry bulb
summer dry bulb
relative humidity

Building heating load

Building cooling load

Mechanical Spacing Conditioning System

Unitary

description of unit

heating efficiency

cooling efficiency

heat output of unit

cooling output of unit

Boiler

total boiler output. If oversized, state reason.

Chiller

total chiller capacity. If oversized, state reason.

List equipment efficiencies

Equipment schedules with motors (mechanical systems)

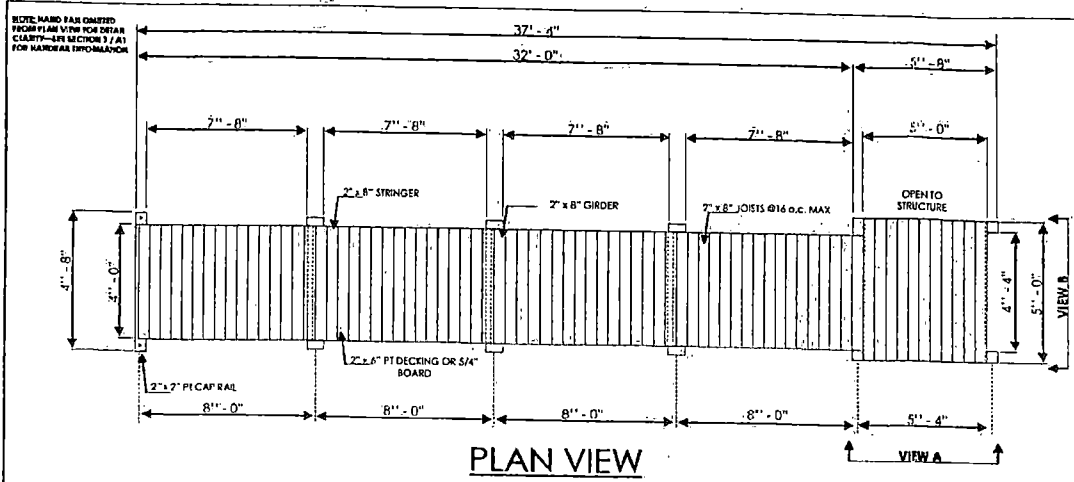
motor horsepower

number of phases

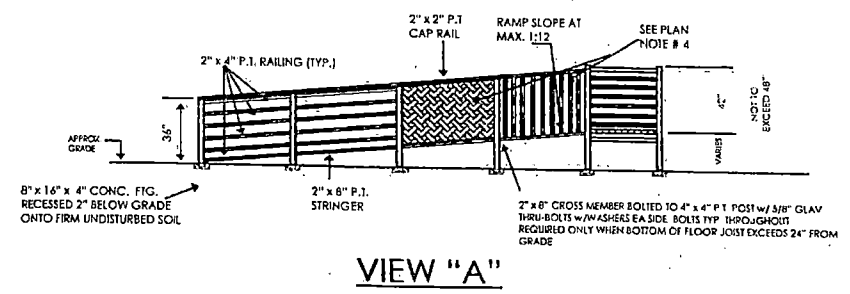
minimum efficiency

motor type

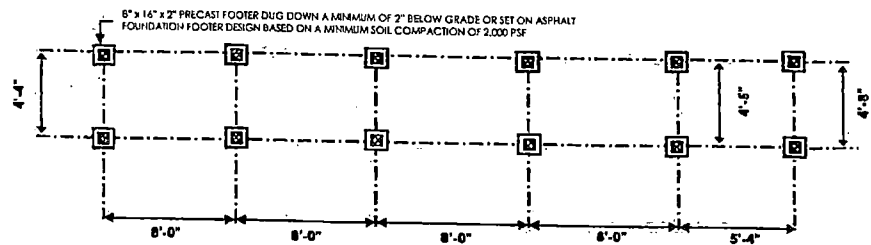
of poles



PLAN VIEW



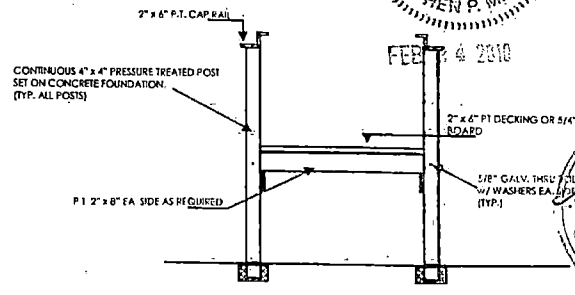
VIEW "A"



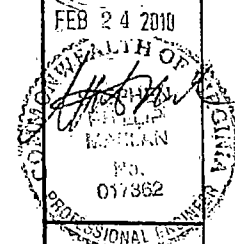
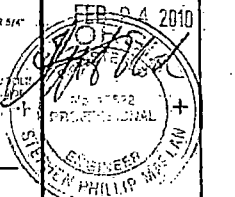
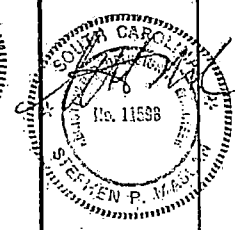
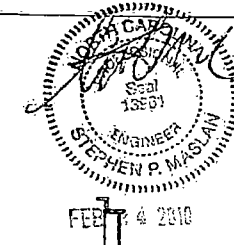
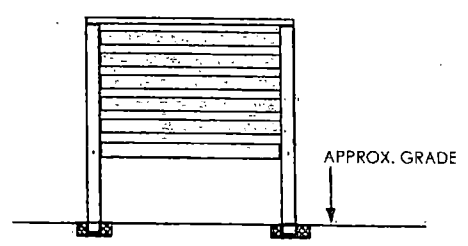
FOUNDATION PLAN

PLAN NOTES

1. ALL CONSTRUCTION SHALL COMPLY WITH GUIDELINES SET FORTH IN THE INTERNATIONAL BUILDING CODE 2006 THROUGH 2009, 2009 NORTH CAROLINA BUILDING CODE, AND AMERICAN WITH DISABILITIES ACT.
2. THE LAYOUT CONFIGURATION MAY VARY DEPENDING ON SITE CONDITIONS. WHERE THE RAMP EXCEEDS 30' MAKES A 90° OR 180° TURN AN INTERMEDIATE LANDING MUST BE INSTALLED. THE SLOPE OF THE RAMP MAY VARY SLIGHTLY PER SITE, HOWEVER THE SLOPE SHALL NOT EXCEED 1:12 AND SHALL CONFORM TO THE REQUIREMENTS OF THE UNIFORM FEDERAL ACCESSIBILITY STANDARDS (UFAS).
3. THE SIZE OF THE LANDING PLATFORM MAY VARY DEPENDING ON THE APPLICATION. HOWEVER IN NO CASE SHALL THE SPAN OF THE SPECIFIED FLOOR JOIST EXCEED 8' WITHOUT BEING SUPPORTED BY A GIRDER OR LEDGER.
4. THE TWO CENTER RAILINGS ON GUARD RAILS CAN BE SUBSTITUTED WITH 1/2" PRESSURE TREATED LATTICE AND/OR PICKETS TO COMPLY WITH IBC. PICKETS SHALL BE SPACED SUCH THAT A 4" DIAMETER SPHERE CANNOT BE PASSED THROUGH.
5. HANDRAILS SHALL EXTEND A MIN. OF 12" BEYOND THE END OF THE RAMP AND PARALLEL FINISH GRADE GRIPPING SURFACE SHALL BE BETWEEN 1 1/2" TO 1 3/4" WIDTH OR OUTSIDE DIAMETER, MOUNTING HEIGHT SHALL BE BETWEEN 34" TO 38".
6. WHEN PLATFORMS EXCEED 33" ABOVE GRADE AND GUARD RAILS MUST BE USED HANDRAILS SHALL BE MOUNTED ON INSIDE OF GUARD RAILS WITH MINIMUM OF 48" CLEARANCE BETWEEN RAILS.



SECTION 1/A1

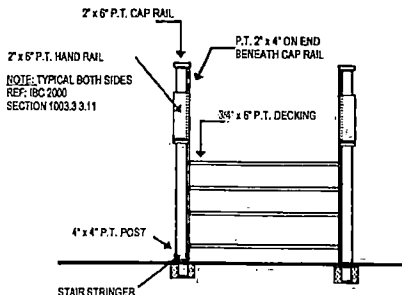
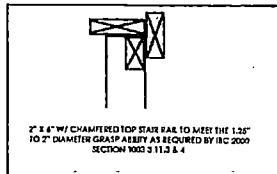


FEB 24 2010
ACCESS RAMP
DETAIL

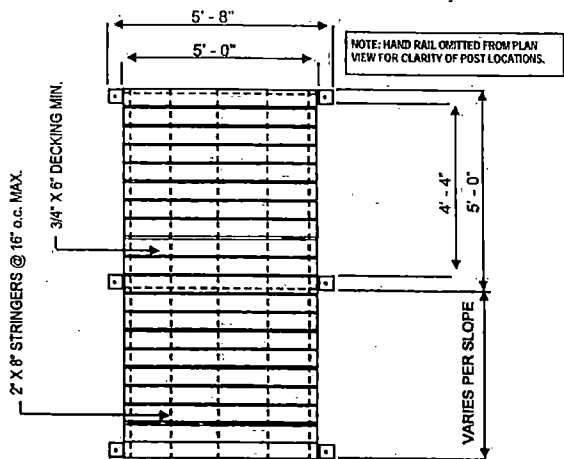
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A1

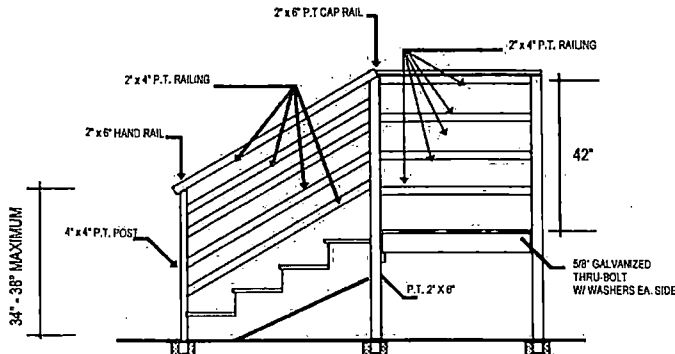
ALTERNATE HANDRAIL DESIGN



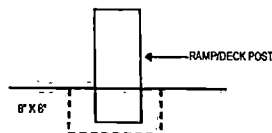
FRONT ELEVATION



PLAN VIEW



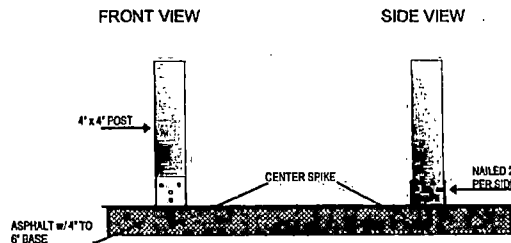
RIGHT ELEVATION



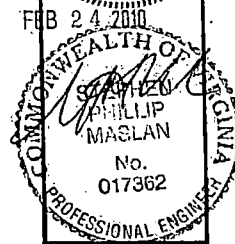
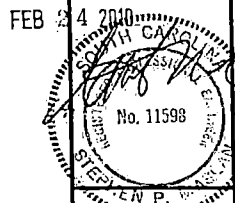
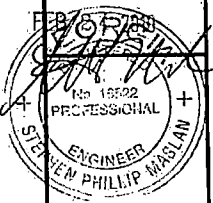
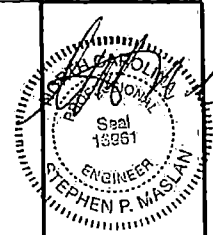
ALTERNATE FOOTING DIAGRAM

PLAN NOTES FOR ALTERNATE FOOTING DIAGRAM

1. FOOTER TO BE A MINIMUM OF 12" DEEP
2. POST SHOULD BEAR ON A MINIMUM OF 4" OF CONCRETE



ALTERNATE DETAIL AT GRADE POST SUPPORT FOR DECKS



STAIR DETAIL FEB 24 2010

Sheet No.

A2

Permit Number

Envelope Compliance Certificate 2000 IECC

Checked By/Date

COMcheck-EZ Software Version 2.5 Release 1

Data filename: C:\Documents and Settings\Ken\My Documents\Comcheck\052404DSI.cck

Section 1: Project Information

Project Name: DSI 14371 A/F
KAG# 052404DSI
Designer/Contractor: Design Space Inc.
Document Author: Kenneth A. Godfrey, P.E.

Section 2: General Information

Building Location (for weather data): Raleigh, North Carolina
Climate Zone: 7a
Heating Degree Days (base 65 degrees F): 3397
Cooling Degree Days (base 65 degrees F): 1493
Project Type: New Construction

Building Type	Floor Area
School	4920

Section 3: Requirements Checklist

Bldg.
Dept.
Use

Air Leakage, Component Certification, and Vapor Retarder Requirements

- [] 1. All joints and penetrations are caulked, gasketed, weather-stripped, or otherwise sealed.
- [] 2. Windows, doors, and skylights certified as meeting leakage requirements.
- [] 3. Component R-values & U-factors labeled as certified.

Note: Vapor retarder not required in this location.



Climate-Specific Requirements

<u>Component Name/Description</u>	<u>Gross Area</u>	<u>Cavity R-Value</u>	<u>Cont. R-Value</u>	<u>Proposed U-Factor</u>	<u>Budget U-Factor</u>
Roof 1: All-Wood Joist/Rafter/Truss	4920	30.0	0.0	0.035	0.068
Exterior Wall 1: Wood Frame, Any Spacing	2272	11.0	0.0	0.103	0.131
Window 1: Metal Frame, Single Pane, Tinted, SHGC 0.75	162	---	---	1.040	0.702
Door 1: Solid	80	---	---	0.560	0.203
Floor 1: All-Wood Joist/Truss	4920	19.0	0.0	0.049	0.090

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

Envelope PASSES: Design 31% better than code

Section 4: Compliance Statement

The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 2000 IECC, Chapter 8, requirements in COMcheck-EZ Version 2.5 Release 1 and to comply with the mandatory requirements in the Requirements Checklist.

KENNETH A. GODFREY
Principal Envelope Designer-Name

Signature

Date

9 MAY 25 2004

Permit Number

Checked By/Date

Lighting Compliance Certificate 2000 IECC

COMcheck-EZ Software Version 2.5 Release 1

Data filename: C:\Documents and Settings\Ken\My Documents\Comcheck\052404DSI.cck

Section 1: Project Information

Project Name: DSI 14371 A/F
KAG# 052404DSI
Designer/Contractor: Design Space Inc.
Document Author: Kenneth A. Godfrey, P.E.

Section 2: General Information

Building Use Description by: Whole Building Type
Project Type: New Construction

Building Type	Floor Area
School	4920

Section 3: Requirements Checklist

- | Bldg. | Dept. | Use | | | | | | | |
|---------------|--------------|---------------|---|---------------|--------------|---------------|------|------|-----|
| [] | [] | [] | Interior Lighting | | | | | | |
| | | | 1. Total actual watts must be less than or equal to total allowed watts | | | | | | |
| | | | <table><thead><tr><th>Allowed Watts</th><th>Actual Watts</th><th>Complies(Y/N)</th></tr></thead><tbody><tr><td>7380</td><td>6552</td><td>YES</td></tr></tbody></table> | Allowed Watts | Actual Watts | Complies(Y/N) | 7380 | 6552 | YES |
| Allowed Watts | Actual Watts | Complies(Y/N) | | | | | | | |
| 7380 | 6552 | YES | | | | | | | |
| [] | [] | [] | Exterior Lighting | | | | | | |
| | | | 2. Efficacy greater than 45 lumens/W | | | | | | |
| | | | <i>Exceptions:</i>
Specialized lighting highlighting features of historic buildings; signage; safety or security lighting; low-voltage landscape lighting. | | | | | | |
| [] | [] | [] | Controls, Switching, and Wiring | | | | | | |
| | | | 3. Independent controls for each space (switch/occupancy sensor). | | | | | | |
| | | | <i>Exception:</i> Areas that must be continuously lighted. | | | | | | |
| [] | [] | [] | 4. Master switch at entry to hotel/motel guest room. | | | | | | |
| [] | [] | [] | 5. Two switches or dimmer in each space to provide uniform light reduction capability. | | | | | | |
| | | | <i>Exceptions:</i>
Only one luminaire in space; An occupant-sensing device controls the area;
The area is a corridor, storage, restroom, or lobby; Areas that must be continuously lighted; | | | | | | |
| [] | [] | [] | 6. Photocell/astronomical time switch on exterior lights. | | | | | | |
| | | | <i>Exceptions:</i> Areas requiring lighting during daylight hours | | | | | | |
| [] | [] | [] | 7. Tandem wired one-lamp and three-lamp ballasted luminaires. | | | | | | |
| | | | <i>Exceptions:</i>
Electronic high-frequency ballasts; Luminaires not on same switch | | | | | | |

Section 4: 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 2000 IECC, Chapter 8, requirements in COMcheck-EZ Version 2.5 Release 1 and to comply with the mandatory requirements in the Requirements Checklist.

KENNETH A. GODFREY
Principal Lighting Designer-Name

Signature

Date RC MAY 25 2004

Lighting Application Worksheet

2000 IECC

COMcheck-EZ Software Version 2.5 Release 1

Section 1: Allowed Lighting Power Calculation

A	B	C	D
	Floor Area (ft ²)	Total Allowed Watts (watts/ft ²)	Allowed Watts (B x C)
Building Type			
School	4920	1.5	7380
Total Allowed Watts =			7380

Section 2: Actual Lighting Power Calculation

A	B	C	D	E	F
Fixture ID	Fixture Description / Lamp Description / Wattage Per Lamp / Ballast	Lamps/ Fixture	# of Fixtures	Fixture Watt.	(D x E)
FL	FLUORESCENT / 48" T12 40W / Magnetic	2	78	84	6552
Total Actual Watts =					6552

Section 3: Compliance Calculation

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

Total Allowed Watts = 7380
 Total Actual Watts = 6552
 Project Compliance = 828

Lighting PASSES: Design 11% better than code

Kenneth A. Godfrey, P.E.
 Consulting Engineer
 1588 Ridge Top Way
 Clearwater, FL 33765

Heat Loss & Gain Analysis
 for
Design Space, Inc.
 Douglas, GA 31533

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 Date 5/22/2004
 DSI 14371 A/F
 KAG# 052404DSI

Reference: ACCA Manual N Fourth Edition

Variables:

Building Destination:	Raleigh, NC	Occupant Content:	OC := 126
Outside Summer DB (Degree F.):	OS := 92	Outside Air CFM/Occupant:	OA := 15
Inside Summer DB (Degree F.):	IS := 75	Incandescent Lighting (Watts):	IL := 0
Outside Winter DB (Degree F.):	OW := 20	Fluorescent Lighting (Watts):	FL := 6240
Inside Winter DB (Degree F.):	IW := 68	(Do not include ballast load)	
Design Grains at 50% RH:	DG := 40	No. of Exterior Doors:	EX := 2
Daily Range (Degree F.):	DR := 20	Winter CFM/Door:	WCFM := 170
Glass Area (SF):	Gross Wall Area (SF):	Summer CFM/Door:	SCFM := 100
North N := 27	NW := 656	Wall Height in feet:	WH := 8.0
East E := 54	EW := 480	U-Values:	
South S := 27	SW := 656	UG := 1.04	Glass
West W := 54	WW := 480	UW := 0.08	Wall
	Gross Areas (SF):	U-Values:	Glass Shading Factor: SF := 0.7
Wood/Metal Doors:	WD := 76	WU := 0.6	Equipment Load: EL := 1
Glass/French Doors:	GD := 4	GU := 1.10	
Roof:	R := 4920	RU := 0.033	
Floor:	F := 4920	FU := 0.05	

Heat Gains (Cooling Loads):

Sensible Heat Gain:

A. Solar Radiation Through Glass:

North: SRN := N·30·SF East: SRE := E·44·SF South: SRS := S·56·SF West: SRW := W·158·SF
 Total: SR := SRN + SRE + SRS + SRW SR = 9261

B. Transmission Gains:

Glass: GA := N + E + S + W TG := GA·UG·(OS - IS) TG = 2864
 Doors: TWG := WD·WU·(OS - IS) TWG = 775 TGD := GD·GU·(OS - IS) TGD = 75
 Walls: Temperature Correction: TC := OS - IS - 20
 Daily Range Correction: DRC := 0.5·(20 - DR) ETD := TC + DRC ETD = -3
 North: TWN := (NW - N)·UW·(ETD + 15)
 East: TWE := (EW - E)·UW·(ETD + 36)
 South: TWS := (SW - S)·UW·(ETD + 23)
 West: TWW := (WW - W)·UW·(ETD + 17)
 Total: TW := TWN + TWE + TWS + TWW TW = 3212



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Roof:	$TR := R \cdot RU \cdot (OS - IS)$	TR = 2760
Floor:	$FR := F \cdot FU \cdot (OS - IS)$	FR = 4182
Total Transmission Gains:	$T := TG + TWG + TGD + TW + TR + FR$	T = 13868
C. Occupants:	$SO := OC \cdot 230$	SO = 28980
D. Lights:	$L := (IL \cdot 3.4) + (FL \cdot 4.1)$	L = 25584
E. Equipment:	$EQ := EL \cdot F$	EQ = 4920
F. Infiltration:	$ICFM := WH \cdot F \cdot \frac{0.4}{60}$ $SI := (ICFM + SCFM \cdot EX) \cdot (OS - IS) \cdot 1.1$	SI = 8647
G. Ducts:	$SD := (SR + T + SO + L + EQ + SI) \cdot 0.05$	SD = 4563
H. Ventilation:	$SV := OC \cdot OA \cdot (OS - IS) \cdot 1.1$	SV = 35343
Total Sensible Heat Gain:	$SHG := SR + T + SO + L + EQ + SI + SD + SV$	SHG = 131166
Latent Heat Gain:		
A. Occupants:	$LO := OC \cdot 190$	LO = 23940
B. Ventilation:	$LV := OC \cdot OA \cdot DG \cdot 0.68$	LV = 51408
C. Infiltration:	$LI := (ICFM + SCFM) \cdot DG \cdot 0.68$	LI = 9857
Total Latent Heat Gain:	$LHG := LO + LV + LI$	LHG = 85205
<u>Total Heat Gain:</u>	$HG := SHG + LHG$	HG = 216371 BTUH

Heat Loss (Heating Loads):

A. Transmission Loss:		
Glass:	$LTG := GA \cdot UG \cdot (IW - OW)$	LTG = 8087
Doors:	$LTWD := WD \cdot WU \cdot (IW - OW)$	LTWD = 2189
	$LTGD := GD \cdot GU \cdot (IW - OW)$	LTGD = 211
Walls:	$LTW := (NW + EW + SW + WW - GA) \cdot UW \cdot (IW - OW)$	LTW = 8102
Roof:	$LR := R \cdot RU \cdot (IW - OW)$	LR = 7793
Floor:	$LF := F \cdot FU \cdot (IW - OW)$	LF = 11808
Total Transmission Loss:	$LT := LTG + LTWD + LTGD + LTW + LR + LF$	LT = 38191
B. Infiltration:	$ICFM := WH \cdot F \cdot \frac{0.6}{60}$ $LI := (ICFM + WCFM \cdot EX) \cdot (IW - OW) \cdot 1.1$	LI = 38734
C. Ducts:	$LD := (LT + LI) \cdot 0.05$	LD = 3846
D. Ventilation:	$LV := OC \cdot OA \cdot (IW - OW) \cdot 1.1$	LV = 99792
<u>Total Heat Loss:</u>	$HL := LT + LI + LD + LV$	HL = 180563 BTUH

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