CITY OF SACRAMENTO
1231 I Street, Sacramento, CA 95814

Permit No: 0513444
Insp Area: 1
Thos Bros: 297F5

Site Address: 2620 CAPITOL AV SAC
Parcel No: 007-0166-014

Sub-Type: REP
Housing (Y/N): N

CONTRACTOR
KIMMEL CONSTRUCTION
1815 STOCKTON BL
SACRAMENTO CA 95816

OWNER
TRINITY CATHEDRAL CHURCH DIO
2620 CAPITOL AV
SACRAMENTO, CA 95816

ARCHITECT

Nature of Work: Change out one 25 ton HVAC unit with a new 15 ton unit , and replace 3 skylights with three new 4 ton HVAC units.

CONSTRUCTION LENDING AGENCY : I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C).

Lender's Name__________ Lender'sAddress__________

LICENSED CONTRACTORS DECLARATION: I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with section 7000) of Division 3 of the Business and Professions Code and my license is in full force and effect.

License Class B License Number 246255 Date 9/1/05 Contractor Signature [illegible]

OWNER-BUILDER DECLARATION: I hereby affirm under penalty of perjury that I am exempt from the contractors License Law for the following reason (Sec. 7031.5, Business and Professions Code; any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 8 of the Business and Professions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500.00);

_____ I, as a owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professional Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or herself or through his/her own employees, provided that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he/she did not build or improve for the purpose of sale.)

_____ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law).

PAID
CITY OF SACRAMENTO

_____ I am exempt under Sec.__________ B & PC for this reason__________

Date__________ Owner Signature__________

SEP 01 2005

IN ISSUING THIS BUILDING PERMIT, the applicant represents, and the city relies on the representation of the applicant, that the applicant verified all measurements and locations shown on the application or accompanying drawings and that the improvement to be constructed does not violate any law or private agreement relating to permissible or prohibited locations for such improvements. This permit does not authorize any illegal location of any improvement or the violation of any private agreement relating to location of improvements.

NEIGHBORHOODS, PLANNING AND DEVELOPMENT SERVICES

I certify that I have read this application and state that all information is correct. I agree to comply with all city and county ordinances and state laws relating to building construction and herby authorize representative(s) of this city to enter upon the abovementioned property for inspection purposes.

Date 9-1-05 Applicant/Agent Signature [illegible]

WORKER'S COMPENSATION DECLARATION: I hereby affirm under penalty of perjury one of the following declarations:

_____ I have and will maintain a certificate of consent to self-insure for workers' compensation as provided for by Section 3700 of the Labor Code, for the performance of work for which the permit is issued.

_____ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier STATE FUND Policy Number 6920002435 Exp Date 11/01/2005

_____ (This section need not be completed if the permit is for $100 or less) I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

Date 9-1-05 Applicant Signature [illegible]

WARNING: FAILURE TO SECURE WORKER'S COMPENSATION COVERAGE IS UNLAWFUL AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000) IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST AND ATTORNEY'S FEE.

THIS PERMIT SHALL EXPIRE BY LIMITATION IF WORK IS NOT COMMENCED WITHIN 180 DAYS.

APPLICATION FOR COMMERCIAL BUILDING PERMIT

CITY OF SACRAMENTO
DEVELOPMENT SERVICES DIVISION
PERMIT SERVICES SECTION
1231 I Street, Rm. 200
Sacramento, CA 95814 (916) 264-7619 FAX 264-7046

ACTIVITY # 05134444 Insp. Area 1

Applicant MUST complete ALL Unshaded areas

ADDRESS 2620 Capitol Ave Suite

PARCEL # 007-0166-014

CONTACT
Name Scott Swenson or Bob Stevens
Street Address 1815 Stockton Blvd
City/State/Zip Sacramento CA 95816
Phone 916-452-6691 FAX 916-736-1129
E-mail: bstevens@kimmelconstruction.com

LICENSED CONTRACTOR Lic No. # 246255
Name Kimmel Construction
Address 1815 Stockton Blvd
City/State/Zip Sacramento CA 95816
Phone 916-452-6691 FAX 916-736-1129
E-mail: bstevens@kimmelconstruction.com

ARCHITECT/ENGINEER
Name RMW Architecture & Interiors
Address 1718 Third St Suite 101
City/State/Zip Sacramento CA 95814
Phone 916-449-1400 FAX 916-449-1414
E-mail: wfinny@rmw.com

OWNER
Name Trinity Cathedral Church
Address 2620 Capitol Ave
City/State/Zip Sacramento Cal 95
Phone 916 446-2515 FAX 916 446-2589
E-mail:

Will permittee have any employees on the jobsite? ☐ No ☒ Yes → INSURANCE CO: State Fund

WORKER'S COMPENSATION POLICY # 2435-2004 EXPIRATION DATE: 11-1-05

NATURE OF WORK IN DETAIL: Change out 1 HVAC Unit
Change out 3 (E) Skylights for 3 (N) HVAC Units
EXISTING 25 TON CHANGED TO 15 TON - SKYLIGHTS REPLACED W/ 3 4 TON UNITS

OCCUPANT/TENANT: Trinity Cathedral Church VALUATION: $ 90,846

FLOOD STATUS: S.C.A.T.

JOB DESCRIPTION: BLDG SHELL APT TI( ) REM( ) SW FIRE ADD OTH

INSPECTION DISCIPLINES	BLDG	MECH	PLUMB	ELEC	SITE	FIRE

# Stories	1st flr Area.	Total Area	Use Zone	Occp Group	Const type	Fire Req. Y / N SPR	Fire Req. Y / N ALARM	Fed Code	Vio. File [H] [Quad]

B	L	P	M	E	F	S	D	PW	UTIL
13A	13A	RMW	RMW	MJB					

COMMENTS:

REGIONAL SANITATION FEES? ☐ Yes ☐ No HEALTH DEPARTMENT? ☐ Yes ☐ No

WATER FLOW TEST FOR NEW BUILDINGS OR ADDITIONS? ☐ Provided ☐ Faxed

HEATING AND COOLING EQUIPMENT QUESTIONNAIRE

Applicant's name: KIMMEL CONSTRUCTION **Phone:** 452-6691

Project Address: 2620 Capitol

Please check the appropriate boxes. **Only check a box if it accurately and completely describes your proposed work, otherwise leave boxes blank.**

1. GROUND-MOUNTED UNIT

a. ☐ There is an existing ground-mounted unit.
- ☐ The existing unit shall be removed. The new unit shall be placed in the same location as the existing unit and shall not exceed the size of the existing unit by more than 25%.
- ☐ The new unit differs in location from the existing unit.
  - ☐ The new unit is fully screened behind a solid fenced area and will not be visible from any street views.
  - ☐ Existing shrubs or buildings will screen the unit from being visible from any street views.

b. ☐ There is no unit in the proposed location.
- ☐ The new unit will be fully screened behind a solid fenced area and will not be visible from any street views.
- ☐ Existing shrubs or buildings will screen the unit from being visible from any street views.

2. ROOF-MOUNTED UNIT

a. ☑ There is an existing roof-mounted unit.
- ☐ The existing unit shall be removed. The new unit shall be placed in the same location as the existing unit and shall not exceed the size of the existing unit by more than 25%.
- ☑ The new unit differs in location from the existing unit. The new unit shall be screened from street views by the building with no portion of the new unit being visible from any street views.

b. ☑ There is no existing roof-mounted unit
- ☑ The new unit shall be screened from street views by the building with no portion of the new unit being visible from any street views

By signing below, the applicant certifies that this form accurately describes the proposed work.

Applicant's signature: Robert A Stevens Date: 9/1/05

For City Staff use only Counter Staff ANDREA DIMATTEO

☑ In a DR District Meets DR criteria? ☑Yes ☐No (route to DR staff)
☐ In a P area or listed (route to P staff)
☐ Not in DR/P area

HVAC UNITS SHALL BE SCREENED FROM ALL STREET VIEWS. A. DiMatteo

S:\USERS\Ellen\procedures\ChecklistMech.wpd

MIYAMOTO
INTERNATIONAL, INC.

Project #: WS05048.01
August 29, 2005

Sacramento
1450 Halyard Drive
Suite One
West Sacramento
CA 95691-5001
916/373-1995 *ph*
916/373-1466 *fax*

Los Angeles
700 South Flower Street
Suite 1010
Los Angeles
CA 90017-4112
213/362-7778 *ph*
213/362-7783 *fax*

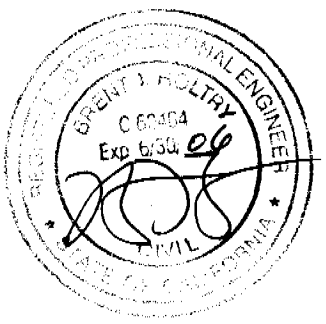
Orange County
1901 East Alton Avenue
Suite 160
Santa Ana
CA 92705-5847
949/579-1170 *ph*
949/579-1180 *fax*

STRUCTURAL CALCULATIONS FOR

Trinity Cathedral Church

- New Mechanical Units

Sacramento, CA



We Conquer Challenges with Creative Options

MIYAMOTO INTERNATIONAL, INC.
STRUCTURAL & EARTHQUAKE ENGINEERS

Job TRINITY CATHEDRAL CHURCH, (N) MECH. UNIT Sheet No. 1

Job Number WS05048.01 Calc. By CCV Date 7/20/2005

LOAD TAKE OFF

ROOF LOADS

DL

ROOFING	4.0 PSF
15/32" PLYWOOD	1.5 PSF
2X6 @ 24" o.c.	1.0 PSF
3 1/2" x 18" @ 8' o.c.	1.7 PSF
INSULATION	0.5 PSF
SPRINKLER SYSTEM	1.5 PSF
5/8" GYPSUM BD.	3.1 PSF
CEILING (SUSPENDED)	1.5 PSF
MISC	1.2 PSF
	16.0 PSF

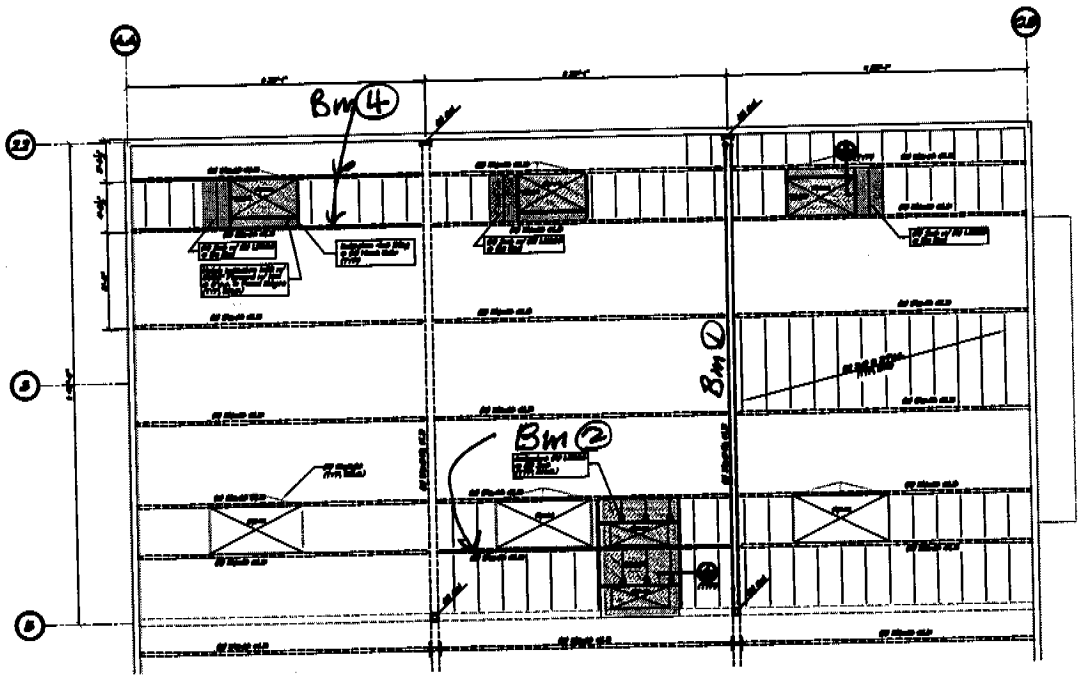
LL (UBC'97 - TABLE 16-C, REDUCIBLE) 20.0 PSF

T_L = 36.0 PSF

UNITARY GAS / ELECTRIC ROOF TOP UNITS 760# (P_1)

PACKAGED GAS / ELECTRIC ROOF TOP UNITS 2200# (P_2)

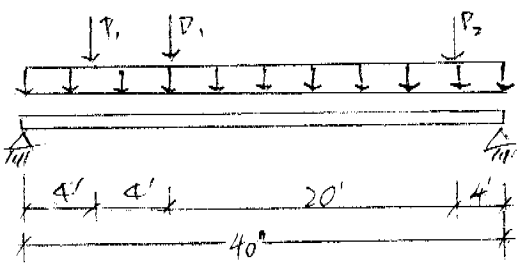
MECHANICAL UNITS INSTALL LOCATION



① (E) 5 1/8" x 34 1/2" GLB L = 40'

5 1/8 x 34 1/2 GLB PROP.
A = 176.8 IN²
S_x = 1017 IN³
I_x = 17540 IN⁴

BEAM LOADING CONDITION W/ MECH. UNITS (CRIT. CASE)



$W_{SELF\ WT.}$ = 42.98 PLF
W_{DL} = (60 PSF)(25') = 400 PLF
W_{LL} = (12 PSF)(25') = 300 PLF ← REDUCED

P_1 = 760 LB, P_2 = 2250 LB / 2 = 1150 LB

f_v = 138 psi < F_v' = 237 psi
f_b = 1834 psi < F_b' = 2530 psi
Δ_{DL} = 0.88 in = L/545
Δ_{LL} = 0.55 in = L/874
Δ_{TL} = 1.43 in = L/336

→ O.K

∴ 5 1/8" x 34 1/2" GLB IS SUFFICIENT TO SUPPORT THE MECH. UNITS

② ~~3½~~ x 18 GLB (ℓ = 25')

DL = 16 psf x 9.5ft/2 = 76 plf
LL = 20psf x 9.5ft/2 = 95 plf
P_{DL} due to large mech unit = 2200 lb @ x=9 ft

f_v = 99 psi < F_v' = 238 psi
f_b = 1847 psi < F_b' = 2944 psi
Δ_{DL} = 0.69" = L/432
Δ_{LL} = 0.31" = L/982
Δ_{TL} = 1.00" = L/300
} → O.K.

③ 2x6 @ 24" o.c (ℓ = 9')

DL = 16 psf x 2ft = 32 plf
LL = 20 psf x 2ft = 40plf

Small Unit w_{DL} = 760 lb / (5ft x 3ft) = 51 psf
Large Unit w_{DL} = 2200lb / (10ft x 5ft) = 44 psf.

DL due to Mech Unit = 51 psf x 2ft = 102 plf

f_b = 1594 psi < F_b' = 1399 psi → N.G

→ Strengthen w/ 4x6

f_v = 45 psi F_v' = 118 psi
f_b = 698 psi F_b' = 1621 psi
Δ_{DL} = 0.10in = L/979
Δ_{LL} = 0.04in = L/2148
Δ_{TL} = 0.14in = L/673
} → O.K.

④ $3\frac{1}{8}$ x 18 GLB (ℓ = 25')

DL = 16psf x (8ft + 4.5ft)/2 = 160 plf
LL = 20psf x (8ft + 4.5ft)/2 = 125 plf

P_{DL} Due to Mech Unit = 600 lb/2 = 300 lb @ ℓ = 12.5 ft

f_v = 83.6 psi < F_v' = 237.5 psi
f_b = 1495 psi < F_b' = 2944 psi
Δ_{DL} = 0.44" = L/676
Δ_{LL} = 0.40" = L/706
Δ_{TL} = 0.85" = L/355

} → O.K.

Title 24 Report for:

Trinity Cathedral
2620 Capitol Avenue
Sacramento, CA 95814

Project Designer:

Report Prepared By:

Jon Burgess
Clarke & Rush Mechanical
4411 Auburn Blvd.
Sacramento, CA 95841-4108
(916) 609-2624

Job Number:

5E5132

Date:

8/25/2005

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2001 Building Energy Efficiency Standards.

This program developed by EnergySoft, LLC (415) 897-6400.

TABLE OF CONTENTS

CERTIFICATE OF COMPLIANCE

Part 1 of 2 **MECH-1**

PROJECT NAME: Trinity Cathedral		DATE: 8/25/2005
PROJECT ADDRESS: 2620 Capitol Avenue Sacramento		Building Permit #
PRINCIPAL DESIGNER - MECHANICAL: Jon Burgess Clarke & Rush Mechanical	TELEPHONE: (916) 609-2624	
DOCUMENTATION AUTHOR: Clarke & Rush Mechanical	TELEPHONE: (916) 609-2624	Checked by/Date Enforcement Agency Use

GENERAL INFORMATION

DATE OF PLANS: 24 AUG 05	BUILDING CONDITIONED FLOOR AREA: 1,800 Sq.Ft.			CLIMATE ZONE: 12
BUILDING TYPE	[X] NONRESIDENTIAL	[ ] HIGH RISE RESIDENTIAL	[ ] HOTEL/MOTEL GUEST ROOM	
PHASE OF CONSTRUCTION	[ ] NEW CONSTRUCTION	[ ] ADDITION	[ ] ALTERATION	[ ] EXISTING + ADDITION
METHOD OF MECHANICAL COMPLIANCE	[X] PRESCRIPTIVE	[ ] PERFORMANCE		
PROOF OF ENVELOPE COMPLIANCE	[X] PREVIOUS ENVELOPE PERMIT	[ ] ENVELOPE COMPLIANCE ATTACHED		

STATEMENT OF COMPLIANCE

This Certificate of Compliance lists the building features and performance specifications needed to comply with Title 24, Parts 1 and 6 of the California Code of Regulations. This certificate applies only to building mechanical requirements.

The documentation preparer hereby certifies that the documentation is accurate and complete.

DOCUMENTATION AUTHOR	SIGNATURE	DATE
Jon Burgess		8/26/05

The Principal Mechanical Designer hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application. The proposed building has been designed to meet the mechanical requirements contained in Sections 110 through115, 120 through 124, 140 through 142, 144 and 145.

Please check one:

- [ ] I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer, or mechanical engineer or I am a licensed architect.
- [X] I affirm that I am eligible under the exemption to Division 3 of the Business and Professions Code by Section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
- [ ] I affirm that I am eligible under the exemption to Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described pursuant to Business and Professions Code sections 5537, 5538, and 6737.1.

PRINCIPAL MECHANICAL DESIGNER - NAME	SIGNATURE	DATE	LIC. #
Jon Burgess Clarke & Rush Mechanical		8/26/05	608665

MECHANICAL MANDATORY MEASURES

Indicate location on plans of Note Block for Mandatory Measures M1

INSTRUCTIONS TO APPLICANT

For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, please refer to the Nonresidential Manual published by the California Energy Commission.

MECH-1: Required on plans for all submittals. Parts 2 may be incorporated in schedules on plans.

MECH-2: Required for all submittals, but may be incorporated in schedules on plans.

MECH-3: Required for all submittals unless required outdoor ventilation rates and airflows are shown on plans per Section 4.3.4.

MECH-4: Required for Prescriptive submittals.

MECH-5: Optional. Performance use only for mechanical distribution summary.

CERTIFICATE OF COMPLIANCE

Part 2 of 2 **MECH-1**

PROJECT NAME	DATE
Trinity Cathedral	8/25/2005

SYSTEM FEATURES

	MECHANICAL SYSTEMS			
SYSTEM NAME	AC 1 - 3	AC 4		NOTE TO FIELD
TIME CONTROL	Programmable Switch	Programmable Switch		
SETBACK CONTROL	Heating & Cooling Required	Heating & Cooling Required		
ISOLATION ZONES	n/a	n/a		
HEAT PUMP THERMOSTAT?	n/a	n/a		
ELECTRIC HEAT?	n/a	n/a		
FAN CONTROL	Constant Volume	Constant Volume		
VAV MINIMUM POSITION CONTROL?	No	No		
SIMULTANEOUS HEAT/COOL?	No	No		
HEATING SUPPLY RESET	Constant Temp	Constant Temp		
COOLING SUPPLY RESET	Constant Temp	Constant Temp		
HEAT REJECTION CONTROL	n/a	n/a		
VENTILATION	Air Balance	Air Balance		
OUTDOOR DAMPER CONTROL	Auto	Auto		
ECONOMIZER TYPE	No Economizer	Fixed Enth (Integrated)		
DESIGN O.A. CFM (MECH-3, COLUMN I)	0 cfm	600 cfm		
HEATING EQUIPMENT TYPE	Gas Furnace	Gas Furnace		
HEATING EQUIPMENT EFFICIENCY	80% AFUE	80% AFUE		
COOLING EQUIPMENT TYPE	Packaged DX	Packaged DX		
COOLING EQUIPMENT EFFICIENCY	13.0 SEER / 10.6 EER	9.6 EER		
MAKE AND MODEL NUMBER	Trane YHC04806A2E Gaspack	Trane YCS150LA2E Gaspack (1)		
PIPE INSULATION REQUIRED?	Yes	Yes		
PIPE/DUCT INSULATION PROTECTED?	No	No		
HEATING DUCT LOCATION / R-VALUE	Ducts in Attic / 4.2	Ducts in Conditioned / n/a		
COOLING DUCT LOCATION / R-VALUE	Ducts in Attic / 4.2	Ducts in Conditioned / n/a		
VERIFIED SEALED DUCTS IN CEILING/ROOF SPACE	No	No		

CODE TABLES: Enter code from table below into columns above.

HEAT PUMP THERMOSTAT?	Y: Yes N: No
ELECTRIC HEAT?	
VAV MINIMUM POSITION CONTROL?	
SIMULTANEOUS HEAT / COOL?	
HEAT AND COOL SUPPLY RESET?	
HIGH EFFICIENCY?	
PIPE INSULATION REQUIRED?	
PIPE/DUCT INSULATION PROTECTED?	
SEALED DUCTS IN CEILING/ROOF SPACE?	

TIME CONTROL	SETBACK CTRL.	ISOLATION ZONES	FAN CONTROL
S: Prog. Switch O: Occupancy Sensor M: Manual Timer	H: Heating C: Cooling B: Both	Enter Number of Isolation Zones.	I: Inlet Vanes P: Variable Pitch V: VFD O: Other C: Curve

VENTILATION	OUTDOOR DAMPER	ECONOMIZER	O.A. CFM
B: Air Balance C: Outside Air Cert. M: Out. Air Measure D: Demand Control N: Natural	A: Auto G: Gravity	A: Air W: Water N: Not Required EC: Economizer Control See Section 144(e)3	Enter Outdoor Air CFM. Note: This shall be no less than Col. H on MECH-3.

NOTES TO FIELD - For Building Department Use Only

MECHANICAL EQUIPMENT SUMMARY

Part 1 of 2 **MECH-2**

PROJECT NAME: Trinity Cathedral

DATE: 8/25/2005

CHILLER AND TOWER SUMMARY

Equipment Name	Equipment Type	Qty.	Efficiency	Tons	PUMPS					
					Tot. Qty	GPM	BHP	Motor Eff.	Drive Eff.	Pump Control
not applicable	Tower w/5.0 bhp fan	0	12 F Approach	0						
Building Loop Pumps					0	75	0.50	77.0%	97.0%	One-Speed
Hot Water Pumps					0	60	0.66	77.0%	97.0%	One-Speed

DHW / BOILER SUMMARY

System Name	System Type	Distribution Type	Qty	Rated Input	Vol. (Gals.)	Energy Factor or Recovery Efficiency	Standby Loss or Pilot	TANK INSUL. Ext. R-Val.
not applicable	Storage Elec.	Hydronic Heating	0	5,120	6	0.95	n/a	n/a
not applicable	Storage Elec.	Standard	0	5,120	6	0.95	n/a	n/a

CENTRAL SYSTEM RATINGS

System Name	System Type	Qty.	HEATING			COOLING			
			Output	Aux. kW	Eff.	Output	Sensible	Efficiency	Economizer Type
Trane YHC04806A2E Gaspack	Packaged DX	3	48,000	0.0	80% AFUE	48,000	37,600	13.0 SEER / 10.6 EER	No Economizer
Trane YCS150LA2E Gaspack (1)	Packaged DX	1	122,000	0.0	80% AFUE	180,000	137,600	9.6 EER	Fixed Enth (Integrated)

CENTRAL SYSTEM FAN SUMMARY

System Name	Fan Type	SUPPLY FAN				RETURN FAN			
		Motor Location	CFM	BHP	Motor Eff.	Drive Eff.	CFM	BHP	Motor Eff.	Drive Eff.
Trane YHC04806A2E Gaspack	Constant Volume	Draw-Through	1,600	0.50	77.0%	97.0%	none			
Trane YCS150LA2E Gaspack (1)	Constant Volume	Blow-Through	6,000	5.00	87.5%	97.0%	none			

MECHANICAL EQUIPMENT SUMMARY

Part 2 of 2 **MECH-2**

PROJECT NAME Trinity Cathedral

DATE 8/25/2005

ZONE TERMINAL SUMMARY

	VAV TERMINAL BOX					TERMINAL FAN				BASEBOARD	
Zone Name	System Type	Qty.	Min. CFM Ratio	Reheat Coil Type	Reheat Coil DeltaT	CFM	BHP	Motor Eff.	Drive Eff.	Type	Output

EXHAUST FAN SUMMARY

EXHAUST FAN					
Room Name	Qty.	CFM	BHP	Motor Eff.	Drive Eff.
Great Hall	1.0	600	0.00	40.0%	97.0%

EXHAUST FAN					
Room Name	Qty.	CFM	BHP	Motor Eff.	Drive Eff.

MECHANICAL VENTILATION

MECH-3

PROJECT NAME	DATE
Trinity Cathedral	8/25/2005

MECHANICAL VENTILATION

A	B	C	D	E	F	G	H	I	J	K
	AREA BASIS			OCCUPANCY BASIS			REQ'D O.A.	DESIGN OUTDOOR AIR CFM	VAV MIN. RATIO	TRANS-FER AIR
ZONE/SYSTEM	COND. AREA (SF)	CFM PER SF	MIN. CFM (B x C)	NO. OF PEOPLE	CFM PER PERSON	MIN. CFM (ExF)	(MAX OF D OR G)			
Great Hall	1,800	0.50	900	36.0	10.0	360	900	600		300
AC 4						Total	900	600		

3@ 100 CFM
4 TON UNITS

C Minimum Ventilation Rate per Section 121, Table 1-F.
E Based on Expected Number of Occupants or at least 50% of Chapter 10 1997 UBC Occupant Density.
I Must be greater than or equal to H, or use Transfer Air. Design Outdoor Air includes ventilation from Supply Air System & Room Exhaust Fans.
K Must be greater than or equal to (H minus I), and, for VAV, greater than or equal to (H-J).

MECHANICAL SIZING AND FAN POWER — MECH-4

PROJECT NAME	DATE
Trinity Cathedral	8/25/2005
SYSTEM NAME	**FLOOR AREA**
AC 1 - 3	0

NOTE: Provide one copy of this form for each mechanical system when using the Prescriptive Approach.

SIZING AND EQUIPMENT SELECTION

1. DESIGN CONDITIONS:		COOLING	HEATING
- OUTDOOR DRY BULB TEMPERATURE	(APPENDIX C)	100 °F	30 °F
- OUTDOOR WET BULB TEMPERATURE	(APPENDIX C)	71 °F	
- INDOOR, DRY BULB TEMPERATURE	SEE ASHRAE CHAPTER 8, 1993 OR APPENDIX B	0 °F	0 °F

2. SIZING:			
- DESIGN OUTDOOR AIR	0 CFM (MECH 3; COLUMN I)	0	0
- ROOM LOADS		0	0
- RETURN VENTED LIGHTING		0	n/a
- RETURN AIR DUCTS		0	0
- RETURN FAN		0	0
- SUPPLY FAN		0	0
- SUPPLY DUCTS		0	0
TOTALS		0	0
SAFETY / WARM-UP FACTOR		1.21	1.43
MAXIMUM ADJUSTED LOAD (TOTALS FROM ABOVE x SAFETY / WARM-UP FACTOR)		0	0

3. SELECTION:		
INSTALLED EQUIPMENT CAPACITY (ADJUSTED FOR DESIGN CONDITIONS)	110,799 Btu / Hr	144,000 Btu / Hr

IF INSTALLED CAPACITY EXCEEDS MAXIMUM ADJUSTED LOAD, EXPLAIN: HP 4 & HP 6 ONLY Require Aux Heaters

FAN POWER CONSUMPTION

A	B	C	D	E	F	G
FAN DESCRIPTION	DESIGN BRAKE HP	EFFICIENCY MOTOR	EFFICIENCY DRIVE	NUMBER OF FANS	PEAK WATTS B x E x 746 / (C X D)	CFM (Supply Fans)
Supply Fan	0.500	77.0%	97.0%	3.0	1,498	4,800
TOTALS					1,498	4,800

NOTE: Include only fan systems exceeding 25 HP (see Section 144). Total Fan System Power Demand may not exceed 0.8 Watts/cfm for constant volume systems or 1.25 Watts/cfm for VAV systems.

TOTAL FAN SYSTEM POWER DEMAND WATTS / CFM: 0.312 (Col. F / Col. G)

MECHANICAL SIZING AND FAN POWER — MECH-4

PROJECT NAME	DATE
Trinity Cathedral	8/25/2005
SYSTEM NAME	**FLOOR AREA**
AC 4	1,800

NOTE: Provide one copy of this form for each mechanical system when using the Prescriptive Approach.

SIZING AND EQUIPMENT SELECTION

		COOLING	HEATING
1. DESIGN CONDITIONS:			
- OUTDOOR DRY BULB TEMPERATURE	(APPENDIX C)	100 °F	30 °F
- OUTDOOR WET BULB TEMPERATURE	(APPENDIX C)	71 °F	
- INDOOR, DRY BULB TEMPERATURE	SEE ASHRAE CHAPTER 8, 1993 OR APPENDIX B	74 °F	70 °F
2. SIZING:			
- DESIGN OUTDOOR AIR	600 CFM (MECH 3; COLUMN I)	16,796	25,840
- ROOM LOADS		157,193	183,718
- RETURN VENTED LIGHTING		0	n/a
- RETURN AIR DUCTS		0	0
- RETURN FAN		0	0
- SUPPLY FAN		0	0
- SUPPLY DUCTS		0	0
TOTALS		173,989	209,558
SAFETY / WARM-UP FACTOR		1.21	1.43
MAXIMUM ADJUSTED LOAD (TOTALS FROM ABOVE x SAFETY / WARM-UP FACTOR)		210,527	299,668
3. SELECTION:			
INSTALLED EQUIPMENT CAPACITY (ADJUSTED FOR DESIGN CONDITIONS)		153,292 Btu / Hr	122,000 Btu / Hr

IF INSTALLED CAPACITY EXCEEDS MAXIMUM ADJUSTED LOAD, EXPLAIN: HP 4 & HP 6 ONLY Require Aux Heaters

FAN POWER CONSUMPTION

A	B	C	D	E	F	G
FAN DESCRIPTION	DESIGN BRAKE HP	EFFICIENCY MOTOR	EFFICIENCY DRIVE	NUMBER OF FANS	PEAK WATTS B x E x 746 / (C X D)	CFM (Supply Fans)
Supply Fan	5.000	87.5%	97.0%	1.0	4,395	6,000
Exhaust Fan	0.000	40.0%	97.0%	1.0	0	
TOTALS					4,395	6,000

NOTE: Include only fan systems exceeding 25 HP (see Section 144). Total Fan System Power Demand may not exceed 0.8 Watts/cfm for constant volume systems or 1.25 Watts/cfm for VAV systems.

TOTAL FAN SYSTEM POWER DEMAND WATTS / CFM: 0.732 (Col. F / Col. G)

HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

PROJECT NAME	DATE
Trinity Cathedral	8/25/2005
SYSTEM NAME	**FLOOR AREA**
AC 4	1,800

ENGINEERING CHECKS

Number of Systems	1
Heating System	
Output per System	122,000
Total Output (Btuh)	122,000
Output (Btuh/sqft)	67.8
Cooling System	
Output per System	180,000
Total Output (Btuh)	180,000
Total Output (Tons)	15.0
Total Output (Btuh/sqft)	100.0
Total Output (sqft/Ton)	120.0
Air System	
CFM per System	6,000
Airflow (cfm)	6,000
Airflow (cfm/sqft)	3.33
Airflow (cfm/Ton)	400.0
Outside Air (%)	10.0
Outside Air (cfm/sqft)	0.33

Note: values above given at ARI conditions

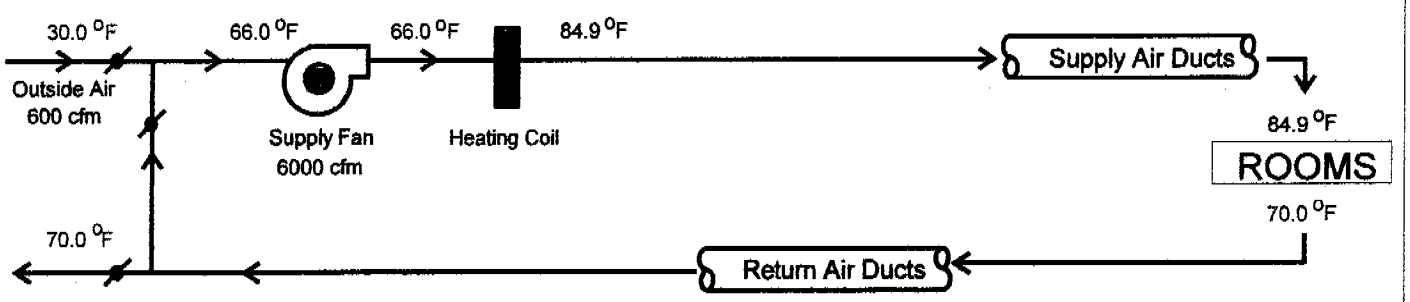
SYSTEM LOAD

	COIL COOLING PEAK			COIL HTG. PEAK	
	CFM	Sensible	Latent	CFM	Sensible
Total Room Loads	6,910	157,193	9,180	11,463	183,718
Return Vented Lighting		0			
Return Air Ducts		0			0
Return Fan		0			0
Ventilation	600	16,796	3,969	600	25,840
Supply Fan		0			0
Supply Air Ducts		0			0
TOTAL SYSTEM LOAD		173,989	13,149		209,558

HVAC EQUIPMENT SELECTION

Trane YCS150LA2E Gaspack (1)	153,292	6,655	122,000
Total Adjusted System Output (Adjusted for Peak Design Conditions)	153,292	6,655	122,000
TIME OF SYSTEM PEAK	Jul 3 pm		Jan 12 am

HEATING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Heating Peak)



COOLING SYSTEM PSYCHROMETRICS (Airstream Temperatures at Time of Cooling Peak)