

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's Address _____

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.

X License Class B License Number 246255 Date 9/1/05 Contractor Signature Raheta Stevens

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).

____ I am exempt under Sec. _____ B & PC for this reason _____

Date _____ Owner Signature _____

PAID
CITY OF SACRAMENTO
SEP 01 2005
NEIGHBORHOOD PLANNING
AND DEVELOPMENT SERVICES

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 account to be constructed does not violate any law or private agreement relating to permissible or prohibited location. _____ does not authorize any illegal location of any improvement or the violation of any private agreement relating to _____

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 Raheta Stevens

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.

X Date 9-1-05 Applicant Signature Raheta Stevens

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 # <u>0513444</u>	Insp. Area <u>1</u>
------------------------------	------------------------

Applicant **MUST** complete ALL Unshaded areas

ADDRESS 2620 Capitol Ave Suite _____
 PARCEL # 007-0166-014

<p style="text-align: center;">CONTACT</p> Name <u>Scott Swenson or Bob Stevens</u> Street Address <u>1815 Stockton Blvd</u> City/State/Zip <u>Sacramento CA 95816</u> Phone <u>916-452-6691</u> FAX <u>916-736-1129</u> E-mail: <u>bstevens@kimmelconstruction.com</u>	<p style="text-align: center;">LICENSED CONTRACTOR Lic No. # <u>246255</u></p> Name <u>Kimmel Construction</u> Address <u>1815 Stockton Blvd</u> City/State/Zip <u>Sacramento CA 95816</u> Phone <u>916-452-6691</u> FAX <u>916-736-1129</u> E-mail: <u>bstevens@kimmelconstruction.com</u>
<p style="text-align: center;">ARCHITECT/ENGINEER</p> Name <u>RMW Architecture & Interiors</u> Address <u>1718 Third St Suite 101</u> City/State/Zip <u>Sacramento CA 95814</u> Phone <u>916-449-1400</u> FAX <u>916-449-1414</u> E-mail: <u>wfinny@rmw.com</u>	<p style="text-align: center;">OWNER</p> Name <u>Trinity Cathedral Church</u> Address <u>2620 Capitol Ave</u> City/State/Zip <u>Sacramento Cal 95</u> Phone <u>916 446-2513</u> FAX <u>916 446-2589</u> 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 (W) 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		Fed Code	Vio. File		
						SPR	ALARM		[H]	[Quad]	
<u>(B)</u>	<u>(L)</u>	<u>(P)</u>	<u>(M)</u>	<u>(E)</u>	<u>F</u>	<u>S</u>	<u>D</u>	<u>PW</u>	<u>UTIL</u>		
<u>1301</u>	<u>1301</u>	<u>RMW</u>	<u>RMW</u>	<u>UMB</u>							

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: 432-6691

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: Rahat A. Stearns 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



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*

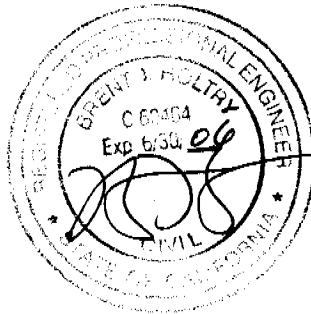
CITY COPY

**STRUCTURAL CALCULATIONS
FOR
Trinity Cathedral Church
- New Mechanical Units
Sacramento, CA**

ISSUED
CITY OF SACRAMENTO

SEP 01 2005

DOWNTOWN PERMIT
CENTER



APPROVED
City of Sacramento Plan Review

STRUCTURAL

John Tang
Signature

9/1/05
Date

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We Conquer Challenges with Creative Options



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
	<hr/>
	16.0 PSF

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

20.0 PSF

TL = 36.0 PSF

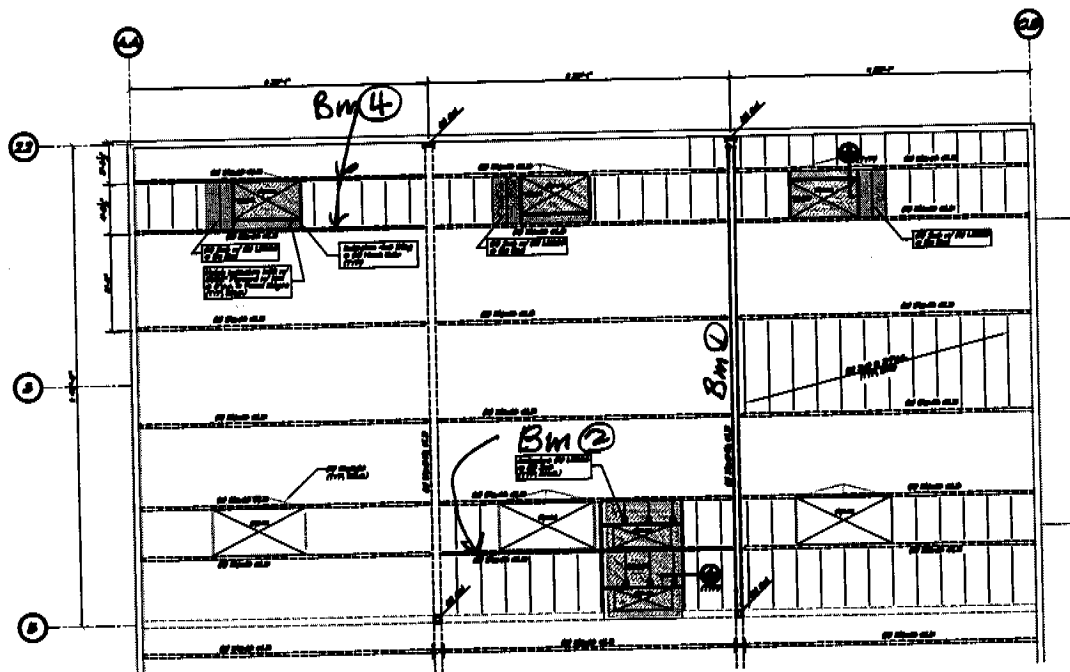
UNITARY GAS / ELECTRIC ROOFTOP UNITS

700# (P₁)

PACKAGED GAS / ELECTRIC ROOFTOP UNITS

2200# (P₂)

MECHANICAL UNITS INSTALL LOCATION

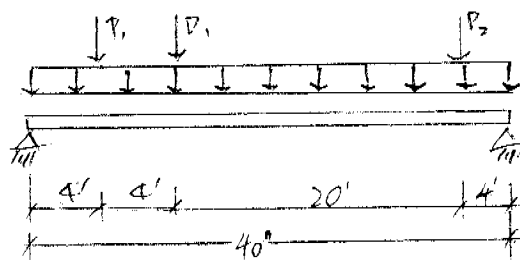


① (E) 5/8" x 34 1/2" GLB

L = 40'

5/8" x 34 1/2" GLB Prop.
 $A = 176.8 \text{ in}^2$
 $S_x = 1017 \text{ in}^3$
 $I_x = 17540 \text{ in}^4$

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



$W_{\text{self wt.}} = 42.98 \text{ PLF}$
 $W_{\text{mech}} = (6 \text{ units})(25') = 150 \text{ PLF}$
 $W_{\text{dl}} = (12 \text{ psf})(33') = 396 \text{ PLF}$
 ← REDUCED

$P_1 = 760 \text{ lb}$, $P_2 = 2267 \text{ lb} / 2 = 1133.5 \text{ lb}$

$f_v = 138 \text{ psi} < F_v = 237 \text{ psi}$
 $f_b = 1834 \text{ psi} < F_b = 2530 \text{ psi}$
 $\Delta_{DL} = 0.98 \text{ in} = L/543$
 $\Delta_{LL} = 0.55 \text{ in} = L/827$
 $\Delta_{TL} = 1.43 \text{ in} = L/336$

→ OK

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



② 3 1/8" x 18 GLB (l = 25')

$$DL = 16 \text{ psf} \times 9.5 \text{ ft} / 2 = 76 \text{ plf}$$

$$LL = 20 \text{ psf} \times 9.5 \text{ ft} / 2 = 95 \text{ plf}$$

$$P_{DL} \text{ due to large mech unit} = 2200 \text{ lb} \cdot @ \quad x = 9 \text{ ft}$$

$$f_v = 99 \text{ psi} < F'_v = 238 \text{ psi}$$

$$f_b = 1847 \text{ psi} < F'_b = 2044 \text{ psi}$$

$$\Delta_{DL} = 0.69" = L/432$$

$$\Delta_{LL} = 0.31" = L/982$$

$$\Delta_{TL} = 1.00" = L/300$$

} → O.K.

③ 2x6 @ 24" o.c (l = 8')

$$DL = 16 \text{ psf} \times 2 \text{ ft} = 32 \text{ plf}$$

$$LL = 20 \text{ psf} \times 2 \text{ ft} = 40 \text{ plf}$$

$$\text{Small Unit } w_{DL} = 760 \text{ lb} / (5 \text{ ft} \times 3 \text{ ft}) = 51 \text{ psf}$$

$$\text{Large Unit } w_{DL} = 2200 \text{ lb} / (10 \text{ ft} \times 5 \text{ ft}) = 44 \text{ psf}$$

$$DL \text{ due to Mech Unit} = 51 \text{ psf} \times 2 \text{ ft} = 102 \text{ plf}$$

$$f_b = 1594 \text{ psi} < F'_b = 1399 \text{ psi} \rightarrow \text{N.G.}$$

→ Strengthen w/ 4x6

$$f_v = 45 \text{ psi} \quad F'_v = 118 \text{ psi}$$

$$f_b = 698 \text{ psi} \quad F'_b = 1621 \text{ psi}$$

$$\Delta_{DL} = 0.107" = L/979$$

$$\Delta_{LL} = 0.047" = L/2148$$

$$\Delta_{TL} = 0.127" = L/673$$

} → O.K.

④ $3\frac{1}{2} \times 18$ GLR (l = 25')

$$DL = 16 \text{ psf} \times (8 \text{ ft} + 4.5 \text{ ft}) / 2 = 160 \text{ Plf}$$

$$LL = 20 \text{ psf} \times (8 \text{ ft} + 4.5 \text{ ft}) / 2 = 125 \text{ Plf}$$

$$\text{Pal due to Mech Unit} = 600 \text{ lb} / 2 = 300 \text{ lb} @ l = 12.5 \text{ ft}$$

$$\left. \begin{aligned} f_u &= 83.6 \text{ psi} < F_u = 237.5 \text{ psi} \\ f_b &= 1495 \text{ psi} < F_b = 2944 \text{ psi} \\ \Delta_{DL} &= 0.44" = L/676 \\ \Delta_{LL} &= 0.40" = L/706 \\ \Delta_{TL} &= 0.85" = L/355 \end{aligned} \right\} \rightarrow \text{OK}$$

TITLE 24 REPORT

Title 24 Report for:

Trinity Cathedral
2620 Capitol Avenue
Sacramento, CA 95814

Project Designer:

ISSUED
CITY OF SACRAMENTO
SEP 01 2005
DOWNTOWN PERMIT
CENTER

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

MICROFILM AT FINAL

CITY COPY

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.

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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	<input checked="" type="checkbox"/> NONRESIDENTIAL	<input type="checkbox"/> HIGH RISE RESIDENTIAL
	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> HOTEL/MOTEL GUEST ROOM
PHASE OF CONSTRUCTION	<input type="checkbox"/> ADDITION	<input type="checkbox"/> ALTERATION
	<input type="checkbox"/> PERFORMANCE	<input type="checkbox"/> EXISTING + ADDITION
METHOD OF MECHANICAL COMPLIANCE	<input checked="" type="checkbox"/> PRESCRIPTIVE	<input type="checkbox"/> PERFORMANCE
PROOF OF ENVELOPE COMPLIANCE	<input checked="" type="checkbox"/> PREVIOUS ENVELOPE PERMIT	<input type="checkbox"/> 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 Jon Burgess	SIGNATURE 	DATE 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 through 115, 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.

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 Jon Burgess Clarke & Rush Mechanical	SIGNATURE 	DATE 8/26/05	LIC. # 60800
--	---	-----------------	-----------------

MECHANICAL MANDATORY MEASURES

Indicate location on plans of Note Block for Mandatory Measures

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 Trinity Cathedral	DATE 8/25/2005
--	--------------------------

SYSTEM FEATURES

SYSTEM NAME	MECHANICAL SYSTEMS		NOTE TO FIELD
	AC 1 - 3	AC 4	
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	Ducts in Attic	Ducts in Conditioned	R-VALUE 4.2
COOLING DUCT LOCATION	Ducts in Attic	Ducts in Conditioned	R-VALUE 4.2
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	TIME CONTROL	SETBACK CTRL.	ISOLATION ZONES	FAN CONTROL
ELECTRIC HEAT?		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
VAV MINIMUM POSITION CONTROL?		VENTILATION	OUTDOOR DAMPER	ECONOMIZER	O.A. CFM
SIMULTANEOUS HEAT / COOL?		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.
HEAT AND COOL SUPPLY RESET?					
HIGH EFFICIENCY?					
PIPE INSULATION REQUIRED?					
PIPE/DUCT INSULATION PROTECTED?					
SEALED DUCTS IN CEILING/ROOF SPACE?					

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			Economizer Type
			Output	Aux. kW	Eff.	Output	Sensible	Efficiency	
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 Erth (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			

PROJECT NAME Trinity Cathedral DATE 8/25/2005

ZONE TERMINAL SUMMARY

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

EXHAUST FAN SUMMARY

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

PROJECT NAME
Trinity Cathedral

DATE
8/25/2005

MECHANICAL VENTILATION

A ZONE/SYSTEM	B AREA BASIS			C OCCUPANCY BASIS			H REQ'D O.A. (MAX OF D OR G)	I DESIGN OUTDOOR AIR CFM	J VAV MIN. RATIO	K TRANS- FER AIR
	B COND. AREA (SF)	C CFM PER SF	D MIN. CFM (B x C)	E NO. OF PEOPLE	F CFM PER PERSON	G MIN. CFM (ExF)				
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 Trinity Cathedral	DATE 8/25/2005
SYSTEM NAME AC 1 - 3	FLOOR AREA 0

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

SIZING AND EQUIPMENT SELECTION

1. DESIGN CONDITIONS:

- OUTDOOR DRY BULB TEMPERATURE (APPENDIX C)
- OUTDOOR WET BULB TEMPERATURE (APPENDIX C)
- INDOOR, DRY BULB TEMPERATURE SEE ASHRAE CHAPTER 8, 1993 OR APPENDIX B

COOLING	HEATING
100°F	30°F
71°F	
0°F	0°F

2. SIZING:

- DESIGN OUTDOOR AIR CFM (MECH 3; COLUMN I)
- ROOM LOADS
- RETURN VENTED LIGHTING
- RETURN AIR DUCTS
- RETURN FAN
- SUPPLY FAN
- SUPPLY DUCTS

0	0
0	0
0	n/a
0	0
0	0
0	0
0	0
0	0

TOTALS

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
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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		NUMBER OF FANS	PEAK WATTS B x E x 746 / (C x D)	CFM (Supply Fans)	
		MOTOR	DRIVE				
Supply Fan	0.500	77.0%	97.0%	3.0	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.

TOTALS	1,498	4,800
TOTAL FAN SYSTEM POWER DEMAND WATTS / CFM	<input type="text" value="0.312"/>	
	Col. F / Col. G	

MECHANICAL SIZING AND FAN POWER

MECH-4

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

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

SIZING AND EQUIPMENT SELECTION

1. DESIGN CONDITIONS:

- OUTDOOR DRY BULB TEMPERATURE (APPENDIX C)
- OUTDOOR WET BULB TEMPERATURE (APPENDIX C)
- INDOOR, DRY BULB TEMPERATURE SEE ASHRAE CHAPTER 8, 1993 OR APPENDIX B

COOLING	HEATING
100 °F	30 °F
71 °F	
74 °F	70 °F

2. SIZING:

- DESIGN OUTDOOR AIR CFM (MECH 3; COLUMN I)
- ROOM LOADS
- RETURN VENTED LIGHTING
- RETURN AIR DUCTS
- RETURN FAN
- SUPPLY FAN
- SUPPLY DUCTS

16,796	25,840
157,193	183,718
0	n/a
0	0
0	0
0	0
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) 153,292 122,000
 Btu / Hr 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		NUMBER OF FANS	PEAK WATTS B x E x 746 / (C x D)	CFM (Supply Fans)	
		MOTOR	DRIVE				
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 0.732
 WATTS / CFM Col. F / Col. G

HVAC SYSTEM HEATING AND COOLING LOADS SUMMARY

PROJECT NAME Trinity Cathedral	DATE 8/25/2005
SYSTEM NAME AC 4	FLOOR AREA 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

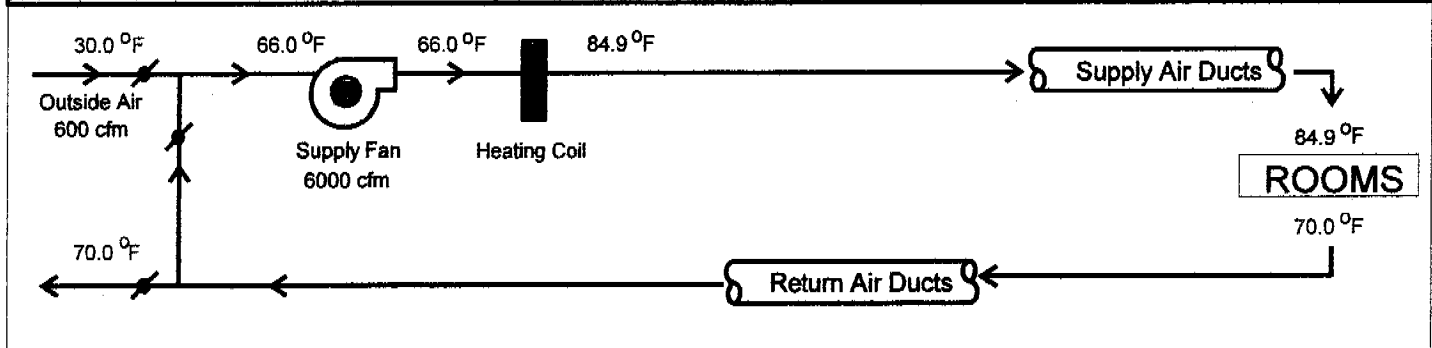
SYSTEM LOAD

	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)

