DATA CENTER DESIGN OVERVIEW

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Critical Facilities Round Table
7th QUARTERLY MEETING

December 17, 2004

DATA CENTER DESIGN OVERVIEW

- INTRODUCTION
- In the next couple of hours I will touch on various aspects of Data Center Design
- The intend today, is not to have a detailed discussion, but to have an overview only of various elements of Data Center Design
- The goal is to get feed-back in what topics the group is interested in so we can schedule a more detailed presentation in the future

DATA CENTER DESIGN OVERVIEW

The following items will be discussed:

- Project Development and Execution Process
- Organizing and Staffing
- Building Design: Interior/Exterior
- Power Distribution
- Process Cooling
- Commissioning
- Energy Efficiency

DATA CENTER DESIGN OVERVIEW

- The Project Development and Execution Process (PDEP) consists of five phases
  1. *Identify and Assess Opportunities*
     - Clearly frame the goal to be pursued and insure alignment with business objectives
     - Perform a preliminary assessment of uncertainties and associated risks
     - Plan for the next phase of the process

DATA CENTER DESIGN OVERVIEW

- PDEP (continued)
  2. *Generate and Select Alternatives*
  - Generate alternatives and reduce the uncertainties of each alternative
  - Develop the expected value for selected alternatives & select the preferred alternative
  - Plan for the next phase of the process

DATA CENTER DESIGN OVERVIEW

- PDEP (continued)
  3. *Develop Preferred Alternatives*
  - Fully define the scope of the alternatives & develop detailed execution plans
  - Check for expected value to meet business objectives
  - Refine estimates & economic analysis to meet funding requirements
  - Submit for funding approval, as appropriate

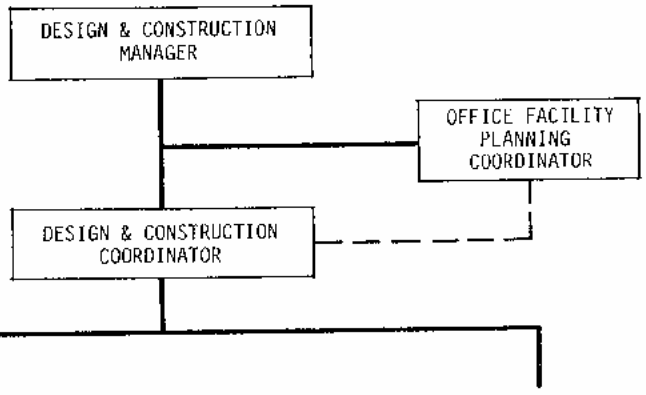
DATA CENTER DESIGN OVERVIEW

- PDEP (continued)
  4. *Execute*
     - Implement execution plan and finalize operating plan
     - Collect, analyze, and share metrics and lessons learned

DATA CENTER DESIGN OVERVIEW

- PDEP (continued)
  5. *Operate and Evaluate*
     - Monitor performance of the asset
     - Benchmark performance of the assets against objectives and competitors
     - Share results and lessons learned
     - Continue performance assessment and identify other opportunities

DESIGN AND CONSTRUCTION ORGANIZATION



DESIGN/CONSTRUCTION

- INSTALLATION AND FACILITY PLANNING
- OPERATIONS
- OFFICE BUILDINGS
- ENGINEERING DEPT.
- ARCHITECT
- CONSULTANT
  - ELECTRICAL
  - MECHANICAL
  - STRUCTURAL
  - SEISMIC
  - FIRE PROTECTION
  - PHYSICAL SECURITY
  - BUILDING MANAGEMENT
  - ACOUSTIC
  - SIGNAGE
  - AUDIO VISUAL
  - ELEVATOR

FIELD REPRESENTATIVE

- REVIEW SHOP DWGS
- INTERFERENCE DWGS.
- INSPECTION
- SPARE PARTS
- MAINTENANCE PROCEDURES
- OPERATIONS INSTRUCTIONS
- "AS-BUILT" DWGS

DATA CENTER DESIGN OVERVIEW

Organization and Staffing

- Project Manager familiar with Company Policy/Operation
- In-House Personnel; i.e. Building Engineer
- Architect
- Asset Protection Consultant
- Electrical Consultant
- Mechanical Consultant
- Structural Consultant
- Data Center Relocation Team

DATA CENTER DESIGN OVERVIEW

- Site Selection
  - New/Old/Own/Lease/Outsource Building
  - Environmental Hazards
  - Transportation
  - Access to Site
  - Utility Service
  - Telecommunication Service

DATA CENTER DESIGN OVERVIEW

- Project Total Data Center Requirements in sq. ft.
  - Hardware Requirements
  - Power Requirements
  - Process Cooling Requirement
  - Access Floor Requirement
  - Support Space (Non-Raised Floor)
  - Circulating Areas

DATA CENTER DESIGN OVERVIEW

- Exterior Consideration
  - Utility
  - Access to Data Center
  - Security
  - Wall and roof Construction

DATA CENTER DESIGN OVERVIEW

- Interior Consideration
  - Floors
  - Walls
  - Building Column Spacing
  - Hallways
  - Freight Elevator
  - Storage/Uncrating Area
  - Power Distribution
  - Process Cooling
  - Water Detection

DATA CENTER DESIGN OVERVIEW

- Commissioning
  - Commissioning is a process that extends through all phases of the project
  - The goal of commissioning is to obtain a facility that operates efficiently, according to the design intent

DATA CENTER DESIGN OVERVIEW

- Commissioning (continued)
  - Commissioning:
    - Provides owners with a facility that operates in accordance with original design intent
    - Reduces energy and operating costs by having systems function at maximum efficiency
    - Reduces the number of contractor call backs
    - Reduces Occupant complaints due to discomfort
    - Provides documentation, training and education for operators and facility managers

DATA CENTER DESIGN OVERVIEW

- Commissioning (continued)
  - The following should be in the commissioning specification
    - Responsibilities of parties involved in the project
    - Description of the commissioning process
    - Requirements for pre-functional performance test
    - Requirements for functional performance test
    - Requirements for O&M manuals
    - Requirements for O&M training
    - Requirements for documentation
    - Requirements for “as-built” drawings

DATA CENTER DESIGN OVERVIEW

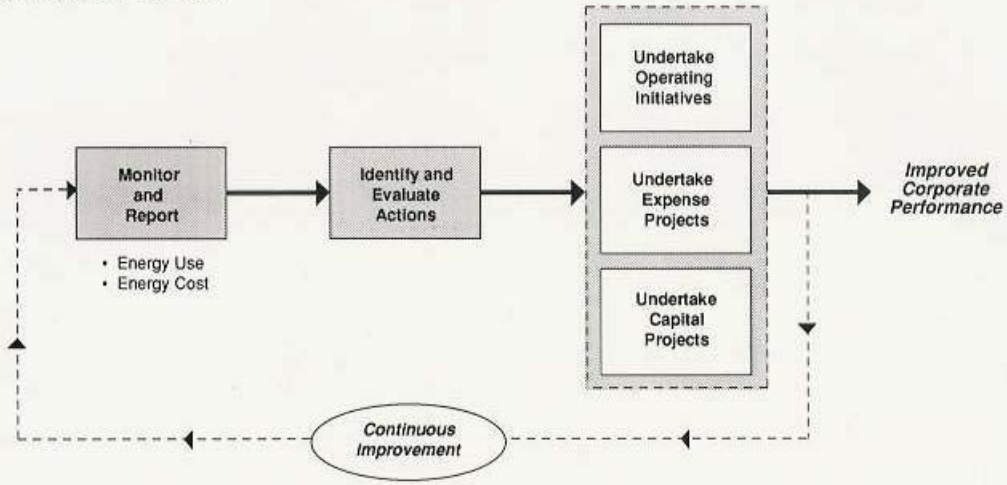
- Energy Efficiency
  - Energy Efficiency vs. Energy Conservation
    - …Both activities lower energy consumption. However, conservation implies a decrease in service; energy efficiency must meet or exceed the quality of service that it replaces…

DATA CENTER DESIGN OVERVIEW

- Energy Efficiency
  - We use the EPA's five-step approach in our energy efficiency management plan
    - Lighting efficiency upgrade (Green Lights)
    - Building tune-up (re-commissioning)
    - Building load reduction
    - HVAC distribution system upgrades
    - HVAC plant upgrade

Core Energy Processes

The five core energy processes and their relationship to one another are shown below.



These processes apply to both energy management and purchasing.

Examples:

	MEASURE	THINK	ACT
Management:	Fuel use/lb of product too high	Determine that furnace is not properly tuned	Adjust controls, perform maintenance as needed
Purchasing:	Energy cost increases	Evaluate rate alternatives	Change rate schedule or intervene in rate case

DATA CENTER DESIGN OVERVIEW

- Energy Efficiency Case Study Office/Warehouse Building
  - Benefits of Green Lights Program
    - Environmental
      - Reduced Power Plant emission-1,000,000 KWH/Year
      - Eliminated PCB Ballasts
    - Reduced Energy Costs
      - Energy Savings-$115,000/year
      - PG&E Rebate-$60,000
      - Project Payout <Nine Month

DATA CENTER DESIGN OVERVIEW

- Energy Efficiency Case Study Office/Warehouse Building (continued)
  - Benefits of Mechanical Upgrades
    - Reduced Energy Usage
      - Electrical Savings: 249,600 KWH/Year
      - Demand Savings: 249KW
      - Gas Savings: 1,416 Therms/Year
    - Reduced Energy Costs
      - Energy Savings: $80,000/Year
      - PG&E Rebate: $60,000
      - Project Payback: < 2 Years

DUBLIN WAREHOUSE
ENERGY CONSUMPTION

Conversion Factors:
KWH to MBTU = 0.003413 x KWH = MMBTU
THERMS TO MMBTU = 0.1 x THERM = MMBTU
SQFT = 202,725

Note: Estimate

	1 ELECTRIC HJN 15 55703 KWH	2 GAS HJN 15 55603 THERMS	3 NET ELECTRIC (1)*0.003413 MMBTU	4 NET GAS (2)*0.1 MMBTU	5 TOTAL (3 + 4) MMBTU	6 KBTU/SF MONTHLY	7 KBTU/SF (CUM)	8 CEI (CUM)
Jan-91	220000	5300	751	530	1,281	6.32	6.32	
Feb-91	211,821	5,500	723	550	1,273	6.28	12.60	
Mar-91	226,200	5,684	772	568	1,340	6.61	19.21	
Apr-91	200,400	3,372	684	337	1,021	5.04	24.25	
May-91	193,200	3,600	659	360	1,019	5.03	29.28	
Jun-91	198,000	3,445	676	345	1,020	5.03	34.31	
Jul-91	214,200	3,614	731	361	1,092	5.39	39.70	
Aug-91	244,800	2,976	836	298	1,133	5.59	45.29	
Sep-91	225,000	2,508	768	251	1,019	5.03	50.31	
Oct-91	218,400	2,405	745	241	986	4.86	55.17	
Nov-91	231,000	2,501	788	250	1,039	5.12	60.30	
Dec-91	199,200	2,875	680	288	967	4.77	**65.07**	
Total	**2,582,221**	**43,780**	**8,813**	**4,378**	**13,191**	**65.07**		
Jan-94	64,800	2,111	221	211	432	2.13	2.13	34
Feb-94	58,200	4,294	199	429	628	3.10	5.23	42
Mar-94	71,400	4,527	244	453	696	3.44	8.67	45
Apr-94	67,200	1,244	229	124	354	1.74	10.41	43
May-94	68,400	1,090	233	109	342	1.69	12.10	41
Jun-94	73,800	960	252	96	348	1.72	13.82	40
Jul-94	99,600	1,108	340	111	451	2.22	16.04	40
Aug-94	111,000	1,288	379	129	508	2.50	18.54	41
Sep-94	110,400	1,285	377	129	505	2.49	21.04	42
Oct-94	82,800	673	283	67	350	1.73	22.76	41
Nov-94	69,000	1,075	235	108	343	1.69	24.45	41
Dec-94	67,800	2,609	231	261	492	2.43	**26.88**	**41**
Total	**944,400**	**22,264**	**3,223**	**2,226**	**5,450**	**26.88**		
Jan-95	63,600	1,841	217	184	401	1.98	1.98	31
Feb-95	58,800	1,942	201	194	395	1.95	3.93	31
Mar-95	57,000	1,802	195	180	375	1.85	5.78	30
Apr-95	49,800	1,868	170	187	357	1.76	7.54	31
May-95	64,200	2,168	219	217	436	2.15	9.69	33
Jun-95	58,200	1,217	199	122	320	1.58	11.27	33
Jul-95	60,000	326	205	33	237	1.17	12.44	31
Aug-95	71,400	325	244	33	276	1.36	13.80	30
Sep-95	55,200	0	188	0	188	0.93	14.73	29
Oct-95	55,800	0	190	0	190	0.94	15.67	28
Nov-95	69,000	862	235	86	322	1.59	17.25	29
Dec-95	34,200	4,174	117	417	534	2.63	**19.89**	**31**
Total	**697,200**	**16,525**	**2,380**	**1,653**	**4,032**	**19.89**		
Jan-96	55,200	4,545	188	455	643	3.17	3.17	50
Feb-96	67,200	3,584	229	358	588	2.90	6.07	48
Mar-96	35,400	3,286	121	329	449	2.22	8.29	43
Apr-96	47,400	1,575	162	158	319	1.57	9.86	41
May-96	49,200	803	168	80	248	1.22	11.09	38
Jun-96	49,800	85	170	9	178	0.88	11.97	35
Jul-96	49,800	0	170	0	170	0.84	12.81	32
Aug-96	52,200	7	178	1	179	0.88	13.69	30
Sep-96	54,000	216	184	22	206	1.02	14.70	29
Oct-96	52,800	2,887	180	289	469	2.31	17.02	31
Nov-96	57,600	1,992	197	199	396	1.95	18.97	31
Dec-96	50,400	0	172	0	172	0.85	**19.82**	**30**
Total	**621,000**	**18,980**	**2,119**	**1,898**	**4,017**	**19.82**		

DUBLIN WAREHOUSE
ENERGY COSTS

SQFT = 202,725

Note: Estimate

	1	2	3	4	5	6
	ELECTRIC RUN 15 55703 COST MONTHLY	GAS RUN 15 55503 COST MONTHLY	TOTAL ENERGY COST MONTHLY	TOTAL ENERGY COST CUMULATIVE	COST PER SF MONTHLY	COST PER KBTU MONTHLY
Jan-91	$17,862	$3,746	$21,609	$21,609	$0.11	$0.0160
Feb-91	$16,141	$2,227	$18,369	$39,977	$0.09	$0.0144
Mar-91	$15,503	$2,204	$17,707	$57,684	$0.09	$0.0132
Apr-91	$18,104	$1,588	$20,722	$78,475	$0.10	$0.0204
May-91	$28,012	$1,752	$29,764	$108,240	$0.16	$0.0292
Jun-91	$30,766	$1,438	$32,204	$140,444	$0.16	$0.0316
Jul-91	$28,802	$1,714	$30,516	$171,260	$0.15	$0.0282
Aug-91	$29,078	$1,134	$30,240	$201,600	$0.15	$0.0267
Sep-91	$30,210	$1,210	$31,420	$232,920	$0.15	$0.0308
Oct-91	$24,932	$1,606	$26,537	$259,257	$0.13	$0.0287
Nov-91	$14,294	$2,389	$16,683	$275,940	$0.05	$0.0161
Dec-91	$11,698	$2,006	$14,494	$290,434	$0.07	$0.0150
Total	$267,280	$23,154	$290,434		$0.12	$0.0220
Jan-94	$6,940	$1,752	$8,692	$8,692	$0.04	$0.0201
Feb-94	$7,559	$2,901	$10,460	$19,152	$0.05	$0.0000
Mar-94	$7,244	$736	$7,980	$27,132	$0.04	$0.0116
Apr-94	$8,189	$528	$8,718	$35,850	$0.04	$0.0246
May-94	$11,[illegible]	$457	$11,386	$47,515	$0.06	$0.0341
Jun-94	$15,043	$537	$15,580	$63,095	$0.08	$0.0448
Jul-94	$16,755	$676	$17,431	$80,527	$0.08	$0.0387
Aug-94	$16,866	$682	$17,348	$97,875	$0.08	$0.0342
Sep-94	$12,543	$354	$12,897	$110,782	$0.06	$0.0255
Oct-94	$9,634	$609	$10,242	$121,025	$0.05	$0.0000
Nov-94	$5,771	$1,849	$7,620	$128,645	$0.04	$0.0000
Dec-94	$5,416	$1,320	$6,736	$135,381	$0.03	$0.0000
Total	$121,959	$13,422	$135,381		$0.06	$0.0248
Jan-95	$5,416	$1,320	$6,736	$6,736	$0.02	$0.0166
Feb-95	$5,042	$1,424	$6,463	$13,202	$0.03	$0.0164
Mar-95	$4,867	$1,322	$6,189	$19,391	$0.03	$0.0165
Apr-95	$4,427	$1,292	$5,719	$25,110	$0.03	$0.0160
May-95	$6,100	$1,160	$7,340	$32,450	$0.04	$0.0165
Jun-95	$8,879	$668	$9,547	$41,997	$0.05	$0.0205
Jul-95	$9,064	$188	$9,252	$51,249	$0.05	$0.0390
Aug-95	$10,787	$188	$10,975	$62,224	$0.05	$0.0397
Sep-95	$8,430	$13	$8,443	$70,667	$0.04	$0.0449
Oct-95	$8,510	$13	$8,523	$79,190	$0.04	$0.0445
Nov-95	$8,550	$639	$9,189	$88,379	$0.05	$0.0266
Dec-95	$2,987	$2,926	$5,913	$94,291	$0.03	$0.0111
Total	$83,118	$11,173	$94,291		$0.04	$0.0234
Jan-96	$4,633	$2,780	$7,413	$7,413	$0.04	$0.0115
Feb-96	$4,795	$898	$5,693	$13,106	$0.03	$0.0097
Mar-96	$1,375	$1,942	$3,317	$16,423	$0.02	$0.0074
Apr-96	$3,655	$724	$4,380	$20,803	$0.02	$0.0137
May-96	$4,481	$375	$4,856	$25,660	$0.02	$0.0125
Jun-96	$7,105	$52	$7,157	$32,817	$0.04	$0.0401
Jul-96	$7,114	$13	$7,125	$39,944	$0.04	$0.0416
Aug-96	$7,444	$17	$7,461	$47,405	$0.04	$0.0417
Sep-96	$7,703	$111	$7,813	$55,219	$0.04	$0.0378
Oct-96	$7,824	$1,099	$8,923	$64,141	$0.04	$0.0190
Nov-96	$7,281	$1,226	$8,507	$72,648	$0.04	$0.0215
Dec-96	$3,877	$0	$3,877	$76,526	$0.02	$0.0225
Total	$69,989	$9,537	$76,526		$0.03	$0.0180

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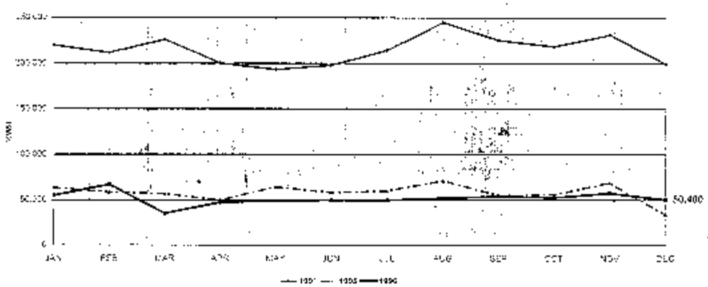
DUBLIN WAREHOUSE
ENERGY COMSUMPTION

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Heating Degree Days	478	314	[illegible]	[illegible]	[illegible]	14	0	0	2	0	0	0
Cooling Degree Days	0	0	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	113	0	0	[illegible]

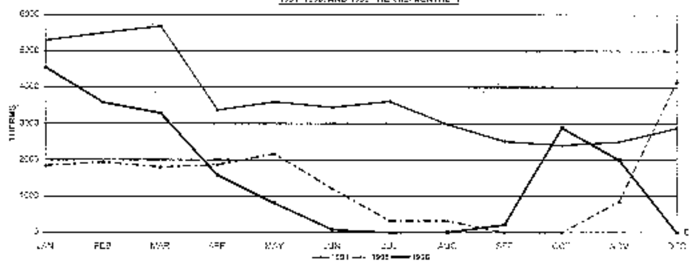
KWH (MONTHLY)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1991	220,000	211,521	226,200	200,400	193,200	[illegible]	214,000	[illegible]	[illegible]	219,400	[illegible]	[illegible]
1995	[illegible]	[illegible]	57,000	49,500	64,200	56,200	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1996	56,000	67,200	35,400	47,400	49,200	49,800	45,600	[illegible]	54,000	52,000	57,600	50,400

1991, 1996, AND 1995 KWH (MONTHLY)



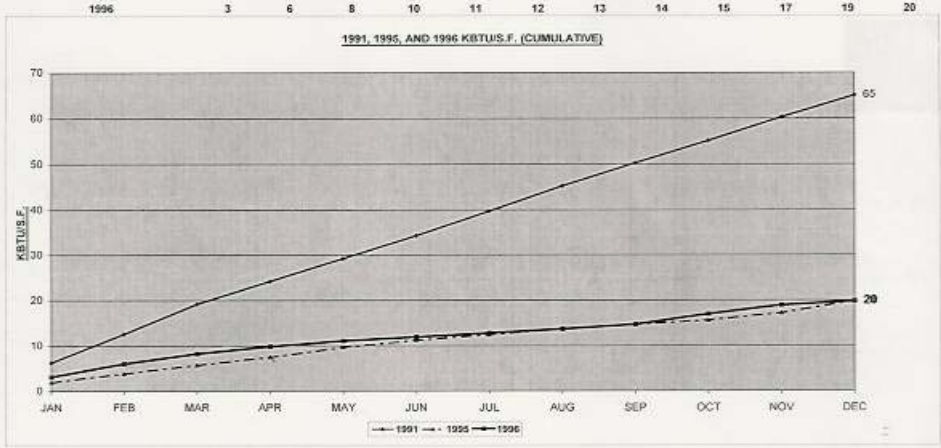
THERMS (MONTHLY)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1991	5,300	[illegible]	[illegible]	3,372	[illegible]	3,445	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1995	[illegible]	[illegible]	[illegible]	[illegible]	2,168	[illegible]	328	[illegible]	0	0	[illegible]	[illegible]
1996	[illegible]	[illegible]	[illegible]	1,576	[illegible]	[illegible]	0	7	[illegible]	[illegible]	[illegible]	0

1991, 1996, AND 1995 THERMS (MONTHLY)

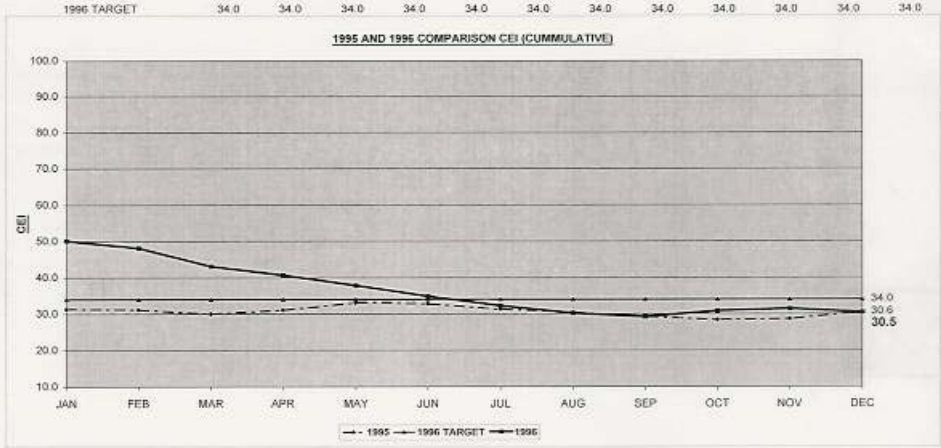


DUBLIN WAREHOUSE
ENERGY CONSUMPTION

KBTU/SF (CUMULATIVE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1991	6	13	19	24	29	34	40	45	50	55	60	65
1995	2	4	6	8	10	11	12	14	15	16	17	20
1996	**3**	**6**	**8**	**10**	**11**	**12**	**13**	**14**	**15**	**17**	**19**	**20**



CEI (CUMULATIVE)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1995	31.3	31.2	30.1	31.1	33.1	32.8	31.3	30.5	29.3	28.4	28.6	30.6
1996	**50.2**	**48.2**	**43.1**	**40.7**	**37.9**	**34.9**	**32.3**	**30.2**	**29.2**	**30.8**	**31.5**	**30.5**
1996 TARGET	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0

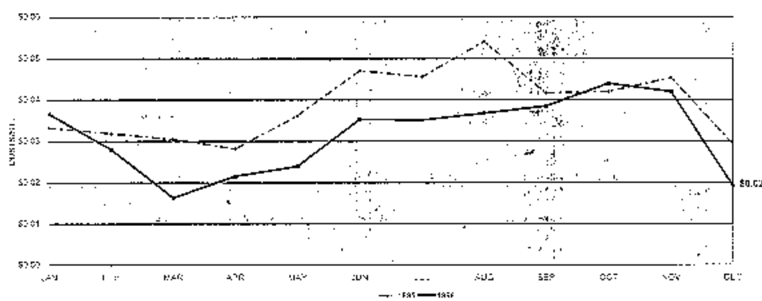


DUBLIN WAREHOUSE
ENERGY COSTS

COST/KBTU (MONTHLY)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
[illegible]	$0.0150	$0.0144	$0.0132	$0.0234	$0.0292	$0.0310	$0.0292	$0.0267	[illegible]	[illegible]	[illegible]	$0.0153
1995	$0.0150	$0.0154	$0.0105	[illegible]	[illegible]	[illegible]	[illegible]	$0.0367	$0.0446	$0.0449	$0.0256	[illegible]
1996	$0.0115	$0.0097	$0.0174	$0.0137	$0.0196	[illegible]	$0.0418	$0.0417	$0.0379	$0.0190	$0.0215	$0.0236

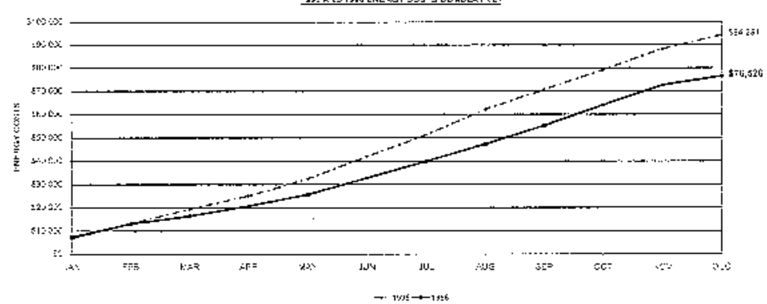
COST/SF (MONTHLY)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1995	$0.03	$0.03	$0.03	$0.03	$0.04	$0.05	$0.05	[illegible]	[illegible]	[illegible]	$0.05	$0.03
1996	$0.04	$0.03	$0.02	$0.02	$0.02	$0.04	$0.04	$0.04	$0.04	$0.04	$0.04	$0.02

1995 AND 1996 COSTS/S.F. (MONTHLY)



ENERGY COST (CUM)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1995	$5,790	$13,202	$15,094	[illegible]	$32,450	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$85,270	$94,231
1996	$7,412	$13,105	$16,428	$20,803	$26,580	$32,817	$39,944	$47,406	$55,219	$64,141	$73,041	$78,525

1995 AND 1996 ENERGY COSTS (CUMULATIVE)

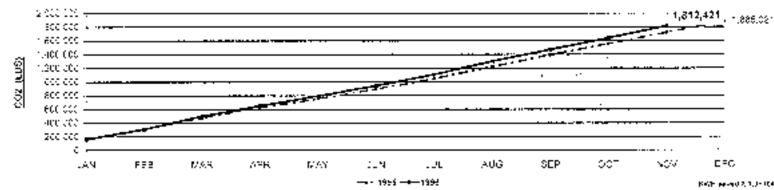


DUBLIN WAREHOUSE EMISSION REDUCTION
AT THE UTILITY COMPANY POWER PLANTS

CO2 Emission Reduction (CUMULATIVE)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1995	155,420	309,421	479,621	629,021	759,221	955,021	1,050,021	1,225,621	1,366,421	1,566,021	1,790,021	1,885,021
1996	154,800	309,421	500,221	653,221	787,221	945,421	1,109,821	1,302,421	1,479,421	1,639,021	1,812,421	

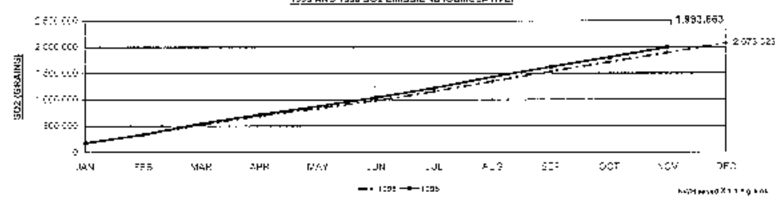
1995 AND 1996 CO2 EMISSIONS (CUMULATIVE)



SO2 Emission Reduction (CUMULATIVE)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1995	172,040	340,960	626,460	662,140	834,049	987,620	1,167,449	1,348,163	1,534,903	1,713,623	1,892,025	2,073,323
1996	181,280	340,363	550,243	718,843	876,943	1,039,563	1,220,803	1,432,663	1,620,763	1,802,923	1,993,663	

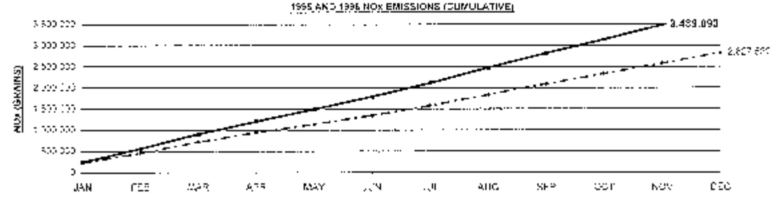
1995 AND 1996 SO2 EMISSIONS (CUMULATIVE)

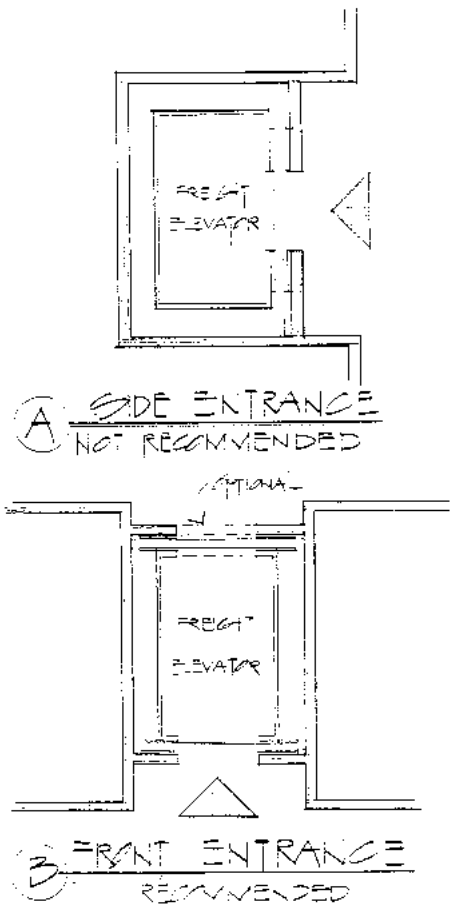


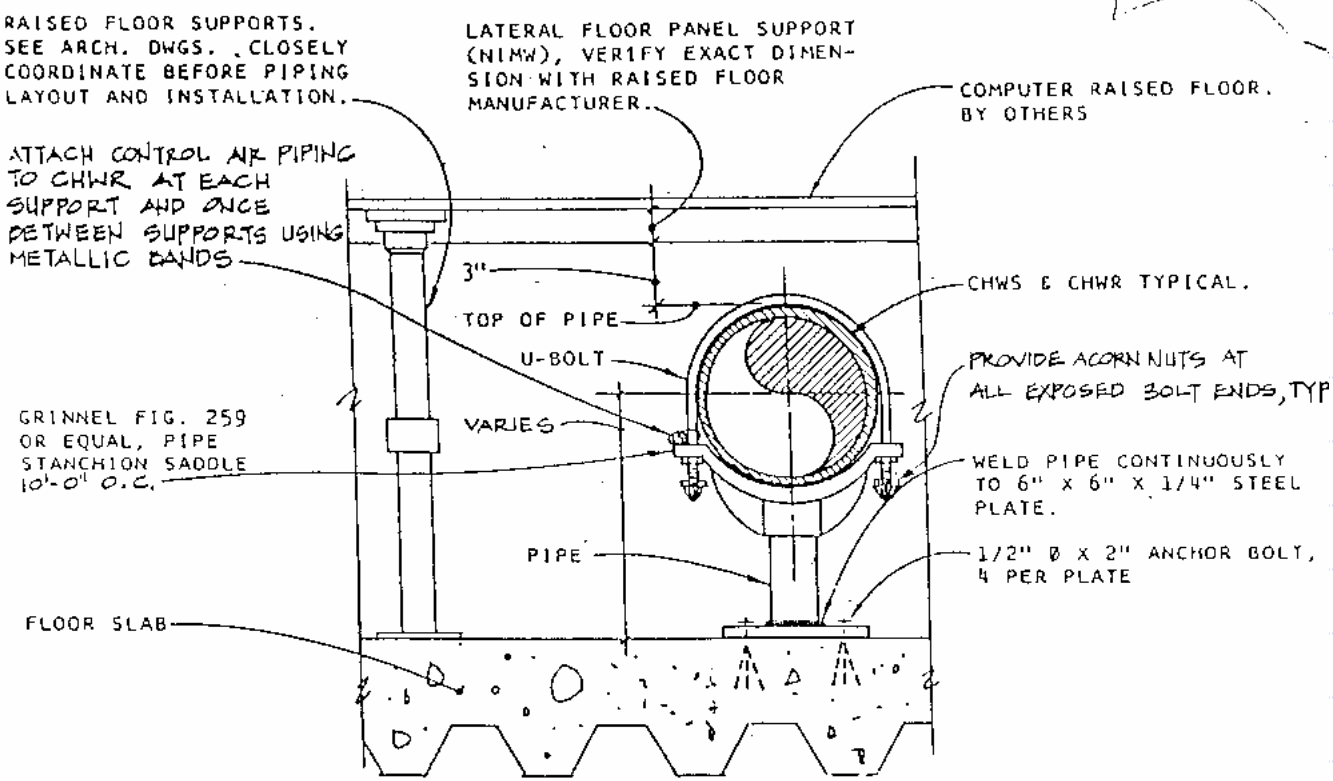
NOx Emission Reduction (CUMULATIVE)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1995	234,600	464,132	717,032	943,832	1,137,332	1,347,032	1,578,332	1,833,432	2,093,132	2,327,032	2,560,032	2,827,832
1996	247,200	564,587	903,706	1,204,064	1,493,612	1,790,357	2,111,402	2,470,305	2,849,555	3,142,555	3,459,093	

1995 AND 1996 NOx EMISSIONS (CUMULATIVE)




FREIGHT
ELEVATOR
A SIDE ENTRANCE
NOT RECOMMENDED
OPTIONAL
FREIGHT
ELEVATOR
B FRONT ENTRANCE
RECOMMENDED

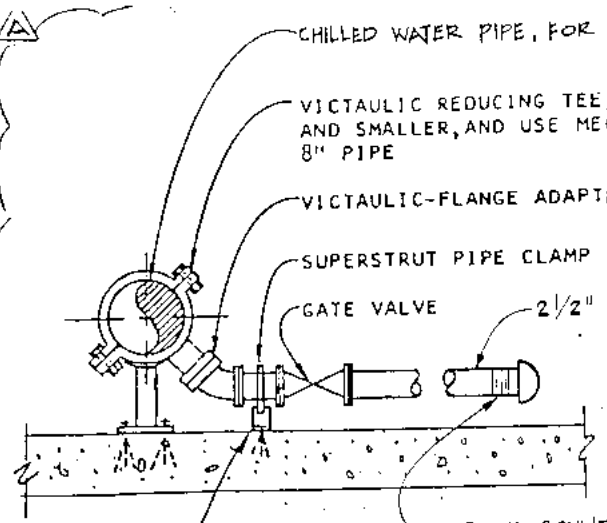


NOTE:
PROTECT CONTROL AIR PIPING FROM CHWR PIPE TO FAN COIL UNIT CONNECTION BY RUNNING PIPING WITHIN A FLEXIBLE METALLIC CONDUIT. SECURELY FASTEN CONDUIT AT BOTH ENDS.

7
M6.06

PIPE SUPPORT DETAIL

NOT TO SCALE



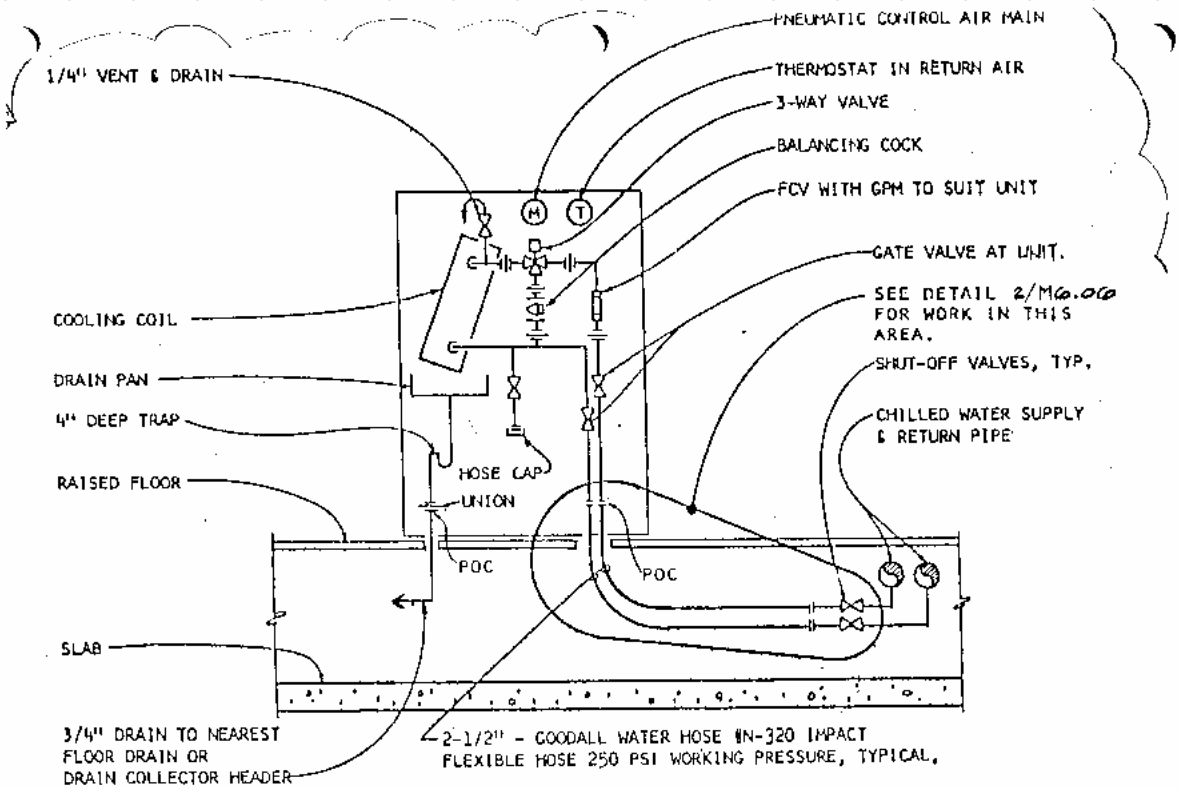
DETAIL NOTES:

1. UNI-STRUT PIPING SUPPORTS SHALL BE USED ONLY AT DISTRIBUTION PIPING 2-1/2" AND SMALLER.
2. ALL PIPING LARGER THAN 2-1/2" SHALL BE SUPPORTED AS PER DETAIL 7/M6.06 FLAT-ON-TOP. PROVIDE ECCENTRIC REDUCERS AS REQUIRED.

TYPICAL SUPPORT DETAIL FOR DISTRIBUTION PIPING

3
16.06

NOT TO SCALE

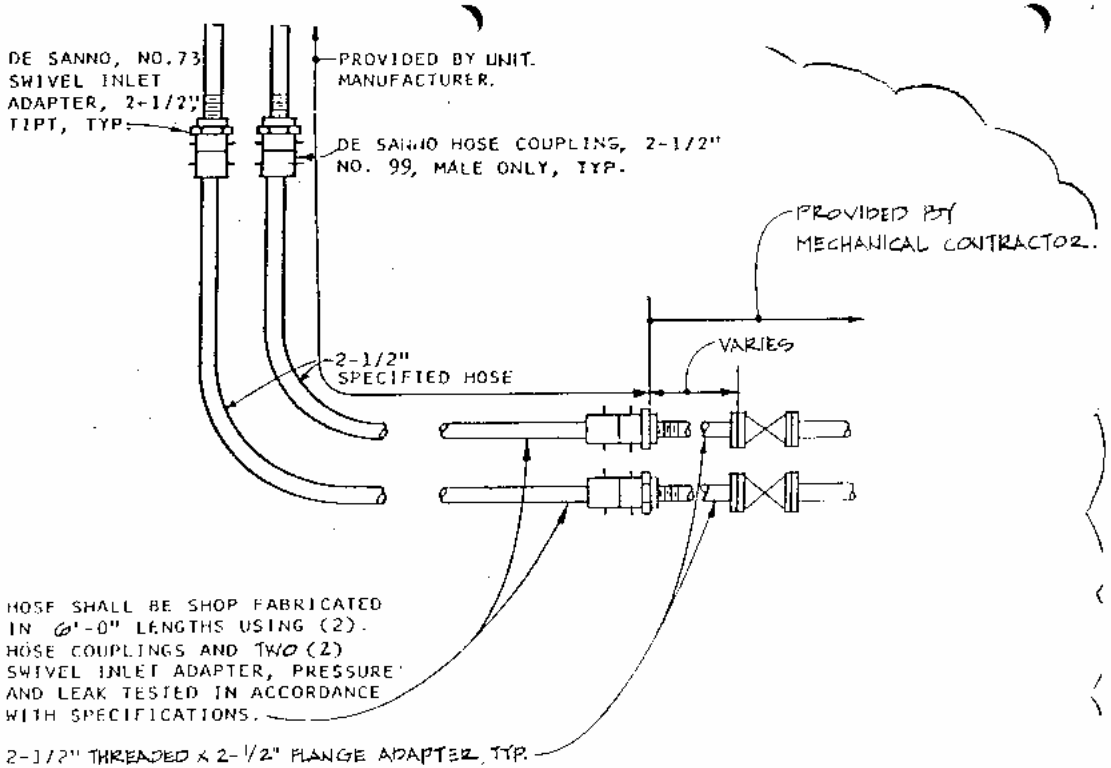


NOTE : PNEUMATIC CONTROL CONNECTION FAN COIL UNIT. BY CONTROLS CONTRACTOR.

COMPUTER ROOM
FAN COIL UNIT – PIPING DIAGRAM

1 / M6.06

NOT TO SCALE (FORMERLY DETAIL 9/M6.02)

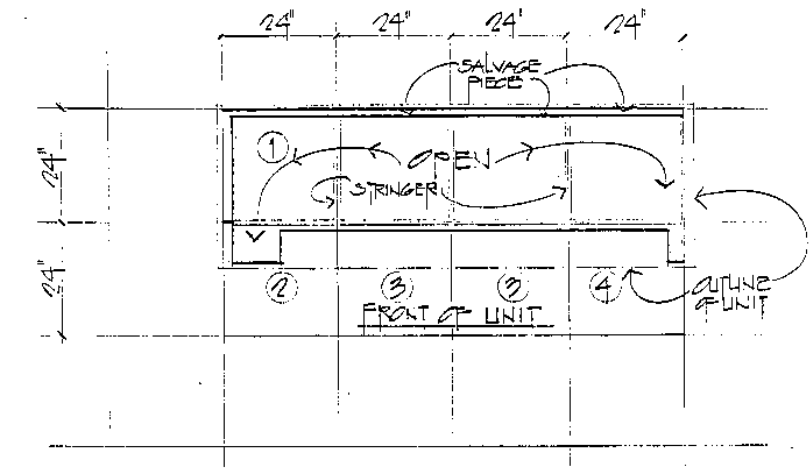


NOTE: ENTIRE ASSEMBLY INSTALLED BY MECHANICAL CONTRACTOR

COMPUTER ROOM FAN COIL UNIT PIPING CONNECTION DETAIL

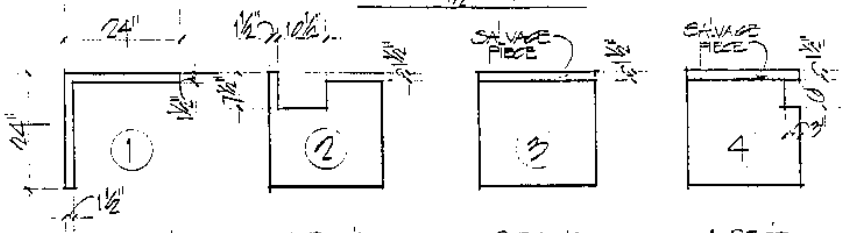
2
M6.06

NOT TO SCALE



PLAN VIEW

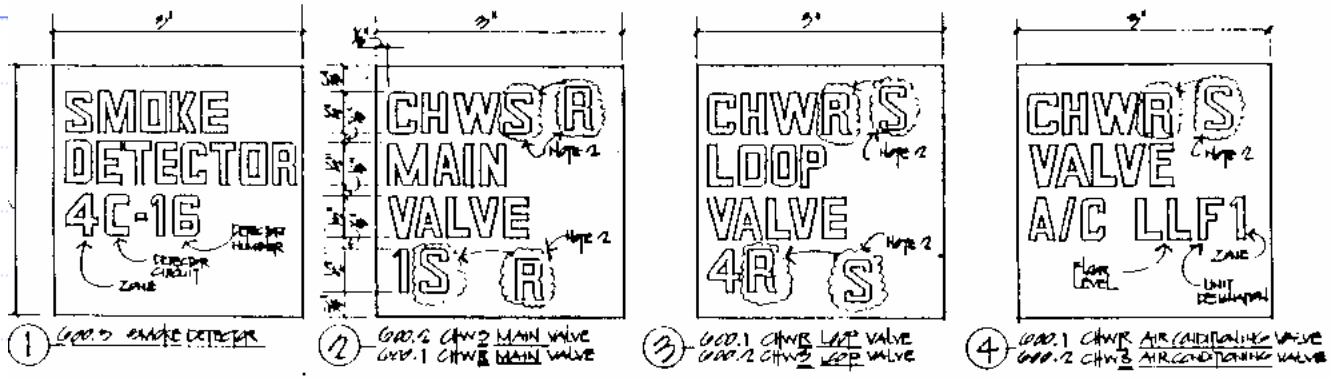
SCALE: 1½" = 1'-0"



NOTE: PLASTIC TRIMS INSTALLED TO OUT EDGES

FLOOR TILE CUTOUTS

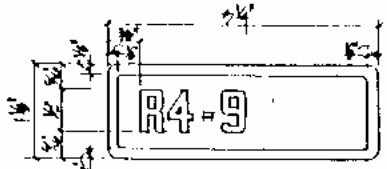
PER FAN/COIL UNIT



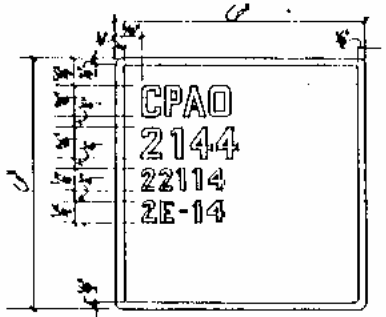
1. 600.3 SMOKE DETECTOR
2. 600.2 CHW2 MAIN VALVE
   600.1 CHWR MAIN VALVE
3. 600.1 CHWR LOOP VALVE
   600.2 CHWS LOOP VALVE
4. 600.1 CHWR AIR CONDITIONING VALVE
   600.2 CHWS AIR CONDITIONING VALVE

SIMILAR TO 600.0 CEILING TAG SIGN UNITS

SCALE: FULL SIZE



5. 500.1 CSD (CRT) PANEL
   SCALE: FULL SIZE
   (PER T/CAREA EQUIPMENT BLDG "H", 2ND FLOOR)

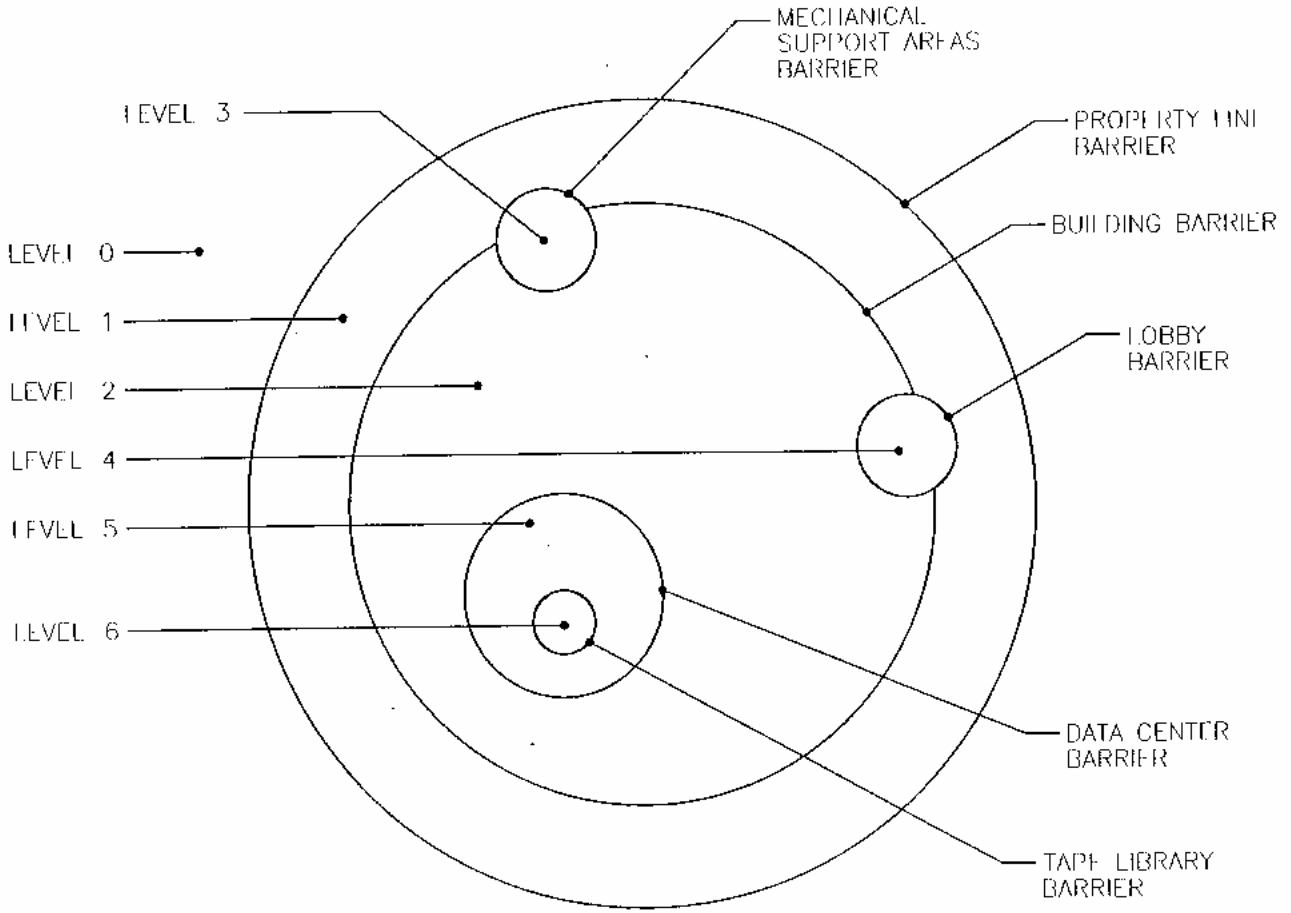


6. SEE 6 CSD MACHINE CONTROL PANEL
   SCALE: HALF SIZE

NOTES:
1. SIZE AND TYPE OF LETTERING SHALL BE AS INDICATED PER MBT DRAWINGS 31/9.02 and 31/9.03.
2. ALL CHILLED WATER (CHW) CEILING TAG SIGNS FOR "MAIN", "LOOP" AND "AIR CONDITIONING" SHALL HAVE ONE (1) EACH "R" AND ONE (1) EACH "S" WITH 1/2" HIGH VALVE NUMBER.

REVISED 10-31-94

BLDGS "H" and "J"
SIGNAGE
SED SKETCH #10733-1



VENN DIAGRAM OF
SECURITY LEVELS

APOI