

COOLING & TEMPERING COILS																
COOLING COILS																
COIL NO.	CAPACITY BTU/HR	SIZE			AIR				WATER							
		L	W	ROWS	ENT DB	ENT WB	LVG WB	FLOW CFM	FACE VEL FPM	TEMPERATURE ENT	TEMPERATURE LVG	FLOW GPM	PRESS. FT. WG			
CC1	512,000	AS REQ'D BY AH-1	90"	90"	AS REQ'D	83	66.4	57	55.2	22,800	550	MAXIMUM	44	51	204	MAXIMUM
CC2	550,000	AS REQ'D BY AH-1	90"	90"	AS REQ'D	84	65	71	59.6	32,000	550	MAXIMUM	44	52	138	MAXIMUM
CC3	1,000,000	AS REQ'D BY AH-2	90"	90"	AS REQ'D	82	66.8	57	56	34,300	600	MAXIMUM	44	52	274	MAXIMUM
TEMPERING COILS																
COIL NO.	CAPACITY BTU/HR	SIZE			AIR				WATER							
		L	W	ROWS	ENT DB	ENT WB	LVG WB	FLOW CFM	FACE VEL FPM	TEMPERATURE ENT	TEMPERATURE LVG	FLOW GPM	PRESS. FT. WG			
TC1	246,000	AS REQ'D BY AH-1	90"	90"	AS REQ'D	46	-	56	-	22,800	550	MAXIMUM	5	-	260	MAXIMUM
TC2	345,000	AS REQ'D BY AH-1	90"	90"	AS REQ'D	55	-	65	-	32,000	550	MAXIMUM	5	-	360	MAXIMUM
TC3	370,000	AS REQ'D BY AH-2	90"	90"	AS REQ'D	46	-	56	-	34,300	600	MAXIMUM	5	-	400	MAXIMUM

UNIT HEATERS													
UNIT NO.	SERVICE	CAPACITY BTU/HR	AIR			WATER			FAN SPEED MOTOR HP	MOUNTING HEIGHT TO BTA (FT)	MANUFACTURER'S MODEL NO.		
			CFM	ENT °F	LVG °F	ENT °F	LVG °F						
UH1 & 2	MECH. RM. LEVEL 4 HGS	120,000	2800	60	220	40	G	1100	1/4	TRANE 18G-5			
UH3	MECH. RM. LEVEL 4 HGS	48,000	1200	60	220	40	2.4	1550	1/2	TRANE 20-5			
UH4	MECH. RM. STAGING AREA LEVEL 1	120,000	2800	60	220	40	G	1100	1/4	TRANE 18G-5			

AIR HANDLERS & FANS													
UNIT NO.	SERVICE	CAPACITY		MAXIMUM FAN SPEED RPM	MAXIMUM TIP SPEED FPM	MAXIMUM OUTLET VELOCITY FPM	MINIMUM MOTOR HP	TYPE	MANUFACTURER'S MODEL NO.				
		CFM	STATIC IN WG										
AH-1	LABORATORIES & OFFICES	22,800	2 1/2	1085 (1)	8600 (1)	1900	20	AIR HANDLER DWDI	TRANE #41 (1) CARRIER #13 (1)				
GF-1	TUNNEL	32,000	2 1/2	720	7600	1900	20	DWDI AIRFOIL	TRANE #AF40DW CARRIER #13A (1)				
AH-2	MECH. RM. LEVEL 4 HGS	84,300	2 1/2	940 (1)	8800 (1)	1900	25 (1)	AIR HANDLER DWDI	TRANE #G8 (1) CARRIER #14 (1)				
GF-1	LABORATORIES & OFFICES	19,400	1 1/2	720	6300	1800	7 1/2	DWDI AIRFOIL	TRANE AF40DW CARRIER #13A (1)				
GF-2	TUNNEL	30,000	2	650	6200	1800	15	DWDI AIRFOIL	TRANE AF40DW CARRIER #13A (1)				
GF-2	MECH. RM. LEVEL 4 HGS	21,300	1 1/2	580	6100	1700	10	DWDI AIRFOIL	TRANE AF40DW CARRIER #13A (1)				
EF-1	MECH. RM. LEVEL 4	5,000	3/8	1060	7000	N/A	3/4	PROPPELLER BELT DRIVE	TRANE PB25				
EF-2	MECH. RM. LEVEL 4	5,000	3/8	1060	7000	N/A	3/4	PROPPELLER BELT DRIVE	TRANE PB25				
EF-3	MECH. RM. LEVEL 4	2,000	1/4	1150	6000	N/A	1/4	PROPPELLER BELT DRIVE	TRANE PB 20				
EF-4	TOILET VENT LEVEL 2	810	1/2	715	3450	N/A	1/2	PROPPELLER BELT DRIVE	CARNES BE3-18B				
EF-5	TOILET VENT LEVEL 1 & 2	1100	3/4	870	4100	N/A	1/2	PROPPELLER BELT DRIVE	CARNES BE3-18C				
* EF-6	WELDING HOOD LEVEL 1	2700	3/8	760	4750	N/A	1	PROPPELLER BELT DRIVE	CARNES BE3-24E				
* EF-7	WELDING HOOD LEVEL 2	1100	3/8	870	4100	N/A	1/2	PROPPELLER BELT DRIVE	CARNES BE3-18C				
* EF-8	TOILET VENT LEVEL 2	140	3/8	1150	2428	N/A	1/2	PROPPELLER BELT DRIVE	CARNES D12-8B				
** EF-9	TOWER ROAD ACCESS EAST ADIT	500	1/4	760	2600	N/A	1/8	PROPPELLER BELT DRIVE	CARNES LS13A				
EF-10	STATION 3 DRIET	570	1/2	1740	5130	N/A	1/20	UTILITY SET	TRANE PD11				
** EF-11	STATION 3 DRIET	460	1/2	859	2200	1000	1/2	UTILITY SET	TRANE SP3				

COOLING TOWERS													
UNIT NO.	SERVICE	CAPACITY BTU/HR	WATER			PUMP HEAD FT.	FAN MOTOR HP	AIR W.G. FT.	MANUFACTURER'S MODEL NO.				
			FLOW GPM	ENT °F	LVG °F								
* CT1 & 2	AIR COND.	3,525,000	725	95	85	22	0.40	2-15HP	BALTIMORE 212 COIL TMA 200 AL BALTIMORE 212 COIL TMA 205A				
CT1A & 2A	AIR COND.	2,025,000	725	62.45	55	22	0.40	2-20HP	BALTIMORE 212 COIL TMA 205A				

CONVERTORS													
UNIT NO.	SERVICE	CAPACITY BTU/HR	WATER			STEAM		FOULING FACTOR	TYPE				
			FLOW GPM	ENT °F	LVG °F	PRESS. PSIG	LB/HR						
C1	HEATING	4,000,000	200	2	180	220	5	4200	SHELL & TUBE				
C2	SNOW MELTING	3,000,000	220	5	180	160	5	3120	SHELL & TUBE				

PUMPS													
UNIT NO.	SERVICE	CAPACITY		SPEED RPM	EFFICIENCY	MOTOR H.P.	TYPE	MANUFACTURER'S MODEL NO.					
		GPM	TDH FT.										
P1	COOLING TOWER WATER	1450	90	1750	84	50	DOUBLE SUCTION	GOULDS #3405 6X8X12					
P2	CONDENSER WATER	1450	90	1750	84	50	"	GOULDS #3405 6X8X12					
P3	CHILLED WATER	600	180	1750	72	50	"	GOULDS #3405 4X6X14					
* P4	CHILLED WATER	600	180	1750	72	50	"	GOULDS #3405 4X6X14					
P5	HOT WATER	200	65	1750	65	7 1/2	"	GOULDS #3655 2 1/2 X 3 X 11					
* P6	HOT WATER	200	65	1750	65	7 1/2	"	GOULDS #3655 2 1/2 X 3 X 11					
P7	SNOW MELT	220	100	1750	67	10	"	GOULDS #3655 2 1/2 X 3 X 11					
PA & PB	CONDENSATE RETURN	5000 EOR G	55 PSI	60 GALLON RECEIVER	2-5	5	"	GOULDS #4344					
P8	CONDENSATE RETURN	5	70	1750	50	1/2	SIMP TYPE	GOULD OR EQUAL					

CHILLERS													
UNIT NO.	CAPACITY TONS	CHILLED WATER			CONDENSER WATER			ELECTRICAL			MANUFACTURER'S MODEL NO.		
		FLOW GPM	ENT °F	LVG °F	FLOW GPM	ENT °F	LVG °F	VOLTS	PHASE	AMPS			
CH1 & 2	250	600	74	44	725	44	85	65	440	2	60	TRANE PCV 2 F CARRIER 150 255 WETTING COIL HC 250	

ABBREVIATIONS

AH	AIR HANDLER AND NUMBER
BTU/HR	BRITISH THERMAL UNIT PER HOUR
CH	CHILLER
CC	COOLING COIL AND NUMBER
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CT	COOLING TOWER
CTR	COOLING TOWER RETURN WATER
CTS	COOLING TOWER SUPPLY WATER
CW	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
EAR	EXHAUST AIR REGISTER
EF	EXHAUST FAN
ENT	ENTERING
F	FAN
FPM	FEET PER MINUTE
FT	FEET
GPM	GALLONS PER MINUTE
HC	HEATING COIL AND NUMBER
HP	HORSE POWER
HW	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
IN	INCHES
LVG	LEAVING
OV	OUTLET VELOCITY
P	PUMP
RA	RETURN AIR
RAZ	RETURN AIR REGISTER
RF	RETURN FAN
RM	RELOCATIONS PER MINUTE
SA	SUPPLY AIR
SAR	SUPPLY AIR REGISTER
SF	SUPPLY FAN
SMR	SNOW MELTING RETURN
SMS	SNOW MELTING SUPPLY
ST(H)	STEAM (HIGH PRESSURE)
ST(L)	STEAM (LOW PRESSURE)
TDH	TOTAL DYNAMIC HEAD
V	VENT
WG	WATER GAGE
°F	DEGREES FAHRENHEIT
D	DRAIN
MAV	MANUAL AIR VENT
ESP	EXTERNAL STATIC PRESSURE
EDR	EQUIVALENT DIRECT RADIATION
TDH	TOTAL DYNAMIC HEAD
WB	WET BULB
DB	DRY BULB
FD	FLOOR DRAIN
KW	KILOWATT
RFD	RECESSED FLOOR DRAIN

PIPING SYMBOLS

—	HIGH PRESSURE STEAM
—	HIGH PRESSURE CONDENSATE RETURN
—	PUMP CONDENSATE RETURN
—	LOW PRESSURE STEAM
—	LOW PRESSURE CONDENSATE RETURN
—	HOT WATER SUPPLY HEATING
—	HOT WATER RETURN
—	CHWS CHILLED WATER SUPPLY
—	CHWR CHILLED WATER RETURN
—	CTS COOLING TOWER SUPPLY
—	CTR COOLING TOWER RETURN
—	CWS CONDENSER WATER SUPPLY
—	CWR CONDENSER WATER RETURN
—	SMS SNOW MELTING SUPPLY ETHYLENE GLYCOL
—	SMR SNOW MELTING RETURN ETHYLENE GLYCOL
—	CAMPUS WATER
—	CONTROL AIR
—	DRAIN
—	CONTROL ELECTRIC WIRING
—	VENT
—	CAPILLARY
—	FLEXIBLE CONNECTION
—	DIRECTION OF FLOW
—	GATE VALVE
—	GLOBE VALVE
—	ANGLE VALVE
—	CHECK VALVE
—	PRESSURE REDUCING VALVES
—	RELIEF VALVE
—	CONTROL VALVE - 2 WAY
—	CONTROL VALVE - 3 WAY
—	PLUG COCK
—	GAGE COCK
—	STRAINER
—	STEAM TRAP
—	FLOW SWITCH
—	PRESSURE GAGE
—	THERMOMETER
—	THERMOCOUPLE WELL
—	THERMOSTAT & ZONE HS
—	HUMIDISTAT
—	VENTURI
—	VACUUM BREAKER
—	DRIP TRAP ASSEMBLY
NPT	NATIONAL PIPE THREAD
DNDI	DOUBLE WIDTH DOUBLE INLET
E.J.	EXPANSION JOINT
G	GUIDE
TC	TEMPERING COIL
ECN	ECONOMIZER
CW	COLD WATER
FD	FLOOR DRAIN
RFD	RECESSED FLOOR DRAIN

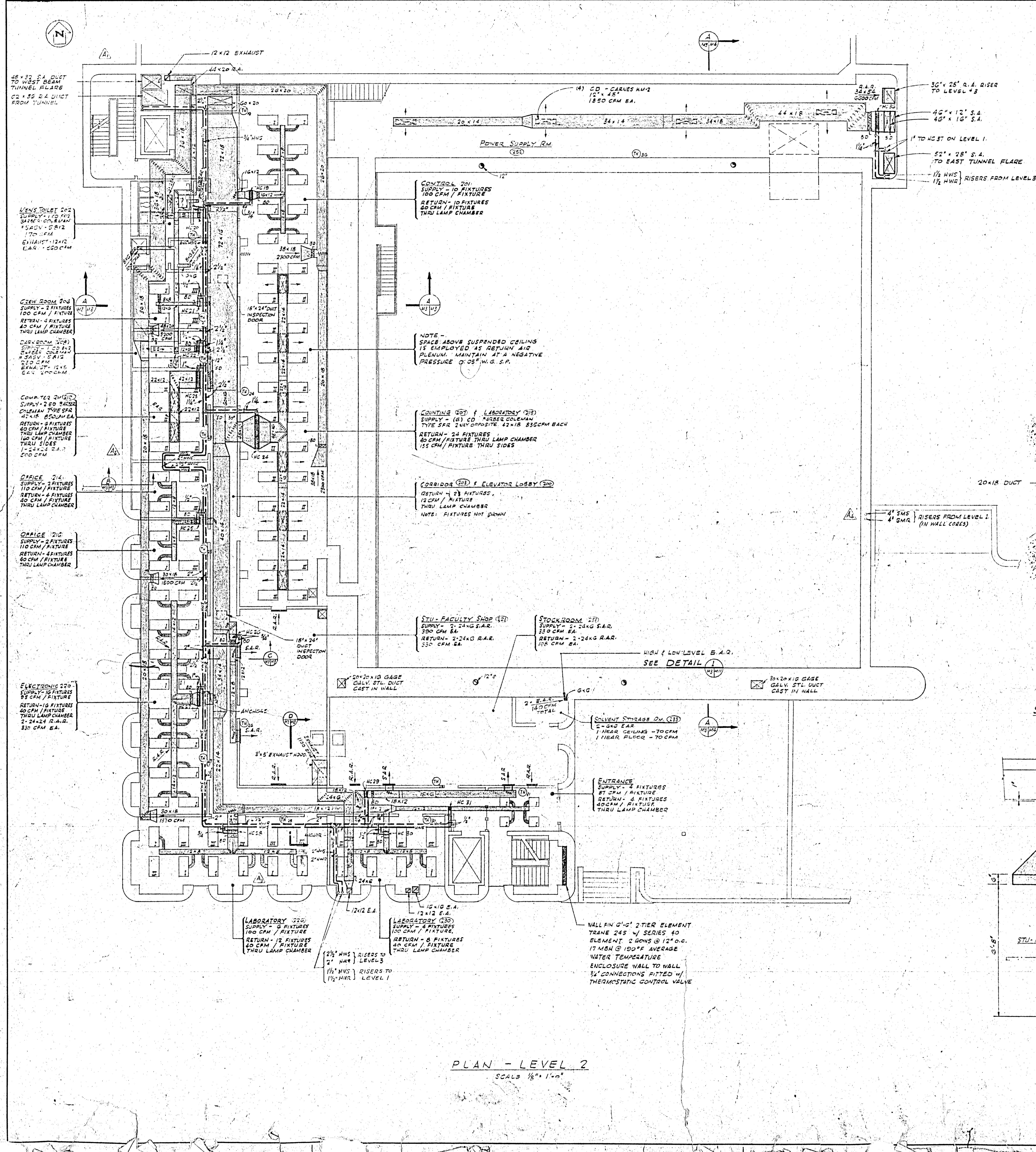
DUCT SYMBOLS

—	DUCTS
—	TURNING VANES
—	EXTRACTOR
—	SPLITTER DAMPER
—	BALANCING DAMPER
—	HEATING COIL AND NUMBER
—	COOLING COIL AND NUMBER
—	SUPPLY DUCT RISER
—	RETURN & EXHAUST DUCT RISER
—	MOTORIZED DAMPER
—	LIGHTING FIXTURE WITH SUPPLY & RETURN AIR THROUGH CHAMBER - DUCT ON SUPPLY ONLY
—	LIGHTING FIXTURE WITH RETURN AIR THROUGH CHAMBER & SIDES - NO DUCT CONNECTION
—	LIGHTING FIXTURE WITH RETURN AIR THROUGH CHAMBER - NO DUCT CONNECTION

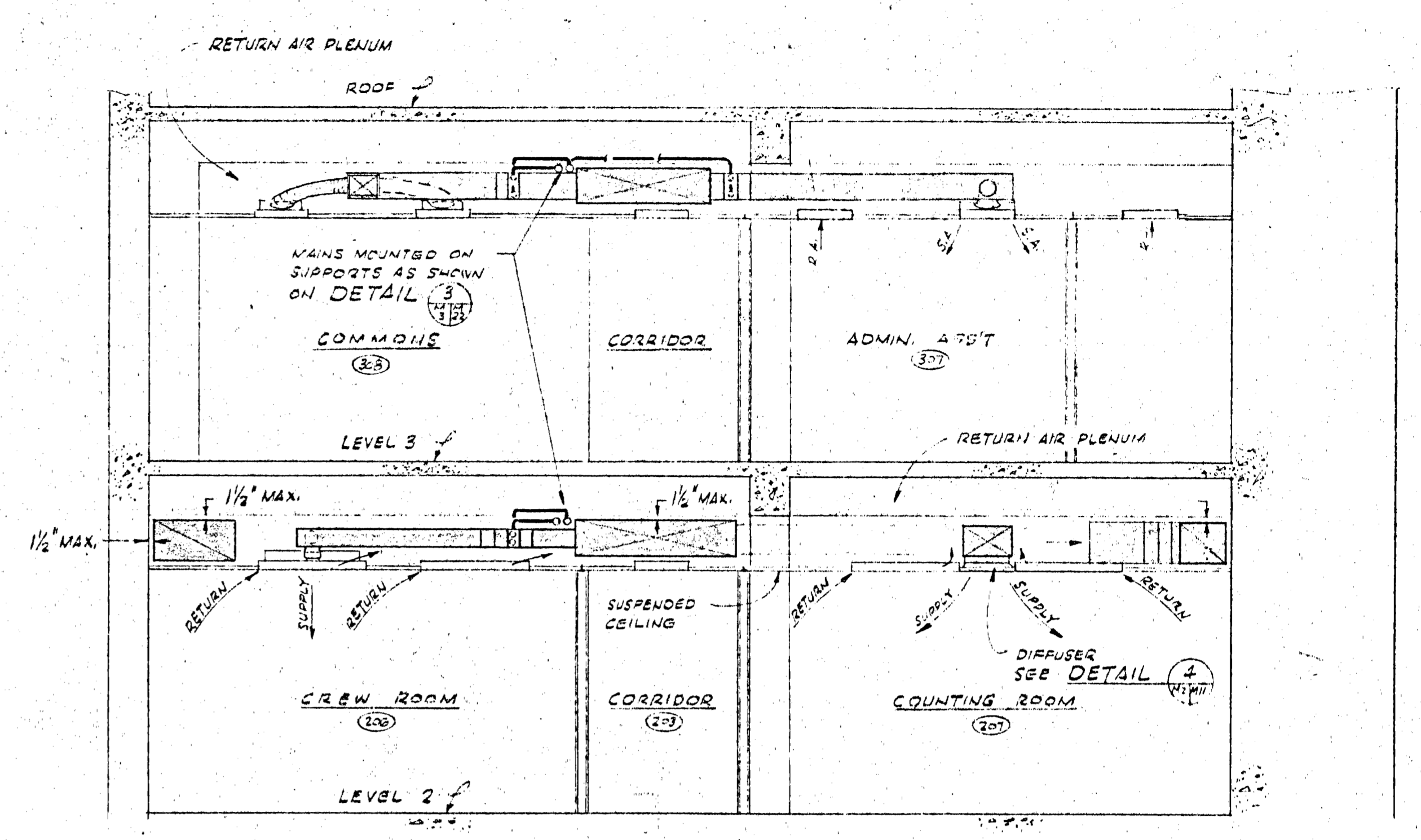
MOTORS
ALL MOTOR 1/2 HP AND LARGER SHALL BE 440 V., 3 PHASE, 60 CYCLE

ZONE REHEAT COILS

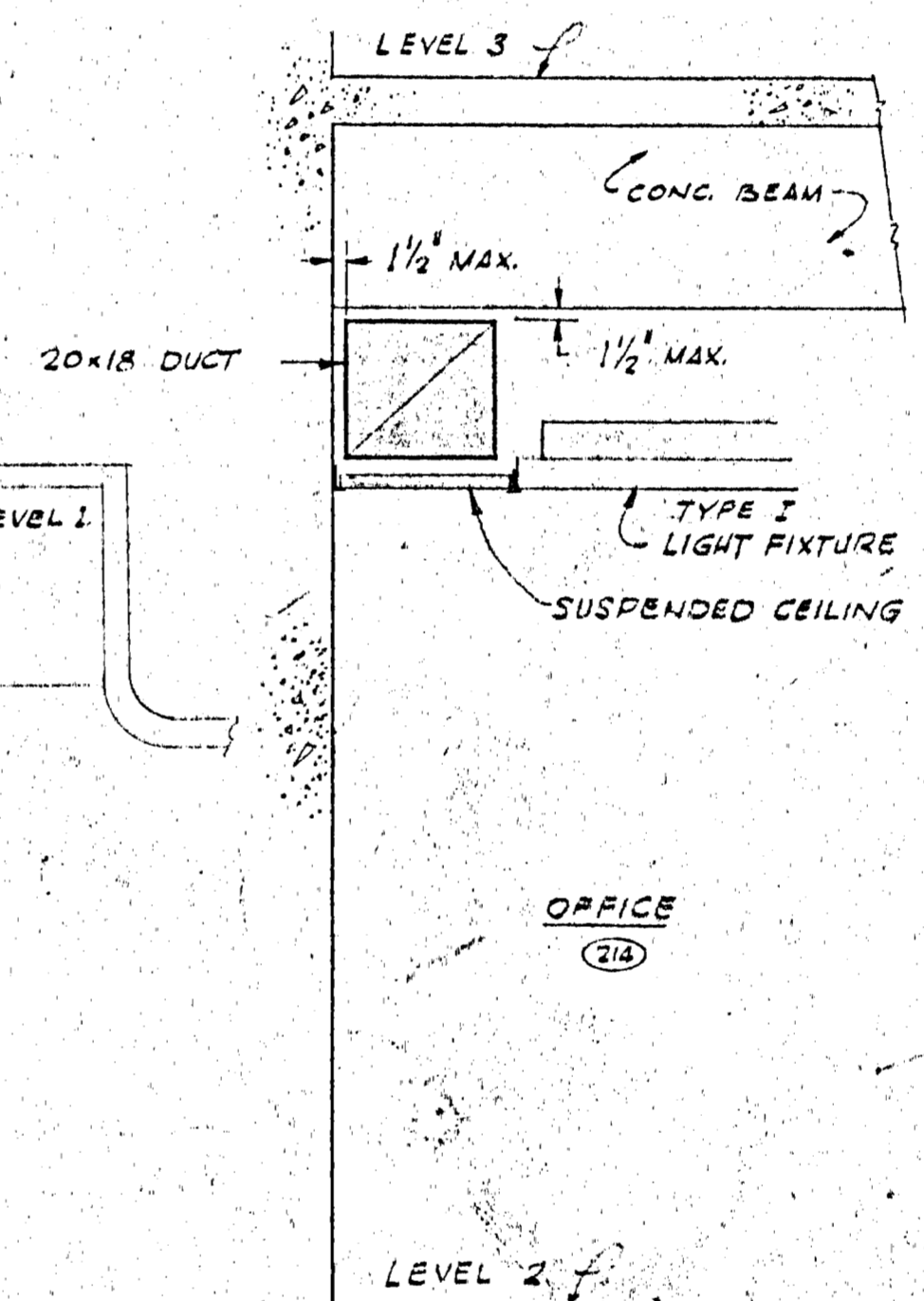
COIL NO.	CAPACITY BTU/HR	SIZE			CONN. SIZE NPT	AIR				WATER				CONN. SIZE NPT	AIR				WATER				
		L	W	ROWS		ENT TEMP °F DB	LVG TEMP °F DB	FLOW CFM	FACE VEL FPM	TEMPERATURE ENT	TEMPERATURE LVG	FLOW GPM	PRESS. FT. WG.		ENT TEMP °F DB	LVG TEMP °F DB	FLOW CFM	FACE VEL FPM	TEMPERATURE ENT	TEMPERATURE LVG	FLOW GPM	PRESS. FT. WG.	
HC-1	48,000	18	12	3/4	58	108	880	500	220	180	2.4	HC-21	10,800	12	G	1/2	58	108	200	400	220	180	.54
HC-2	21,500	12	12	1/2			400	400			1.08	HC-22	12,410	12	G	1/2			230	460			.62
HC-3	21,100	12	12	1/2			390	390			1.05	HC-23	91,800	42	12	1			1700	485			4.50
HC-4	10,800	12	G	1/2			200	400			0.54	HC-24	270,540	84	18	1 1/2			5010	480			3.02
HC-5	37,500	18	12	3/4			700	580			1.9	HC-25	23,760	12	12	1/2			440	440			1.19
HC-6	28,700	24	G	3/4			550	550			1.49	HC-26	42,100	18	12	3/4			780	520			2.11
HC-7	8,100	12	G	1/2			150	300			0.40	HC-27	81,000	36	12	1			1500	500			4.05
HC-8	28,700	24	G	3/4			550	550			1.49	HC-28	32,400	24	12	3/4			600	300			1.02
HC-9	18,100	12	12	3/4			520	520			1.41	HC-29	35,000	18	12	3/4			660	410			1.80
HC-10	29,700	24	G	3/4			520	520			1.41	HC-30	21,000	12	12	1/2			400	400			1.08
HC-11	28,100	12	12	3/4			520	520			1.41	HC-31	18,000	12	12	1/2	58	108	350	350			1.02
HC-12	28,700	24	G	3/4			550	550			1.40	HC-32	434,000	84	36	2	60	85	16000	750			21.7
HC-13	28,100	12	12	3/4			520	520			1.41	HC-33	434,000	84	36	2	60	85	16000	750			21.7
HC-14	47,500	18	12	3/4			750	600			2.02	HC-34	762,000	72	36	2	58	112.8	13000	720			33.1
HC-15	49,700	24	12	3/4			920	460			0.15	HC-35	138,000	42	24	1			82	500	720		



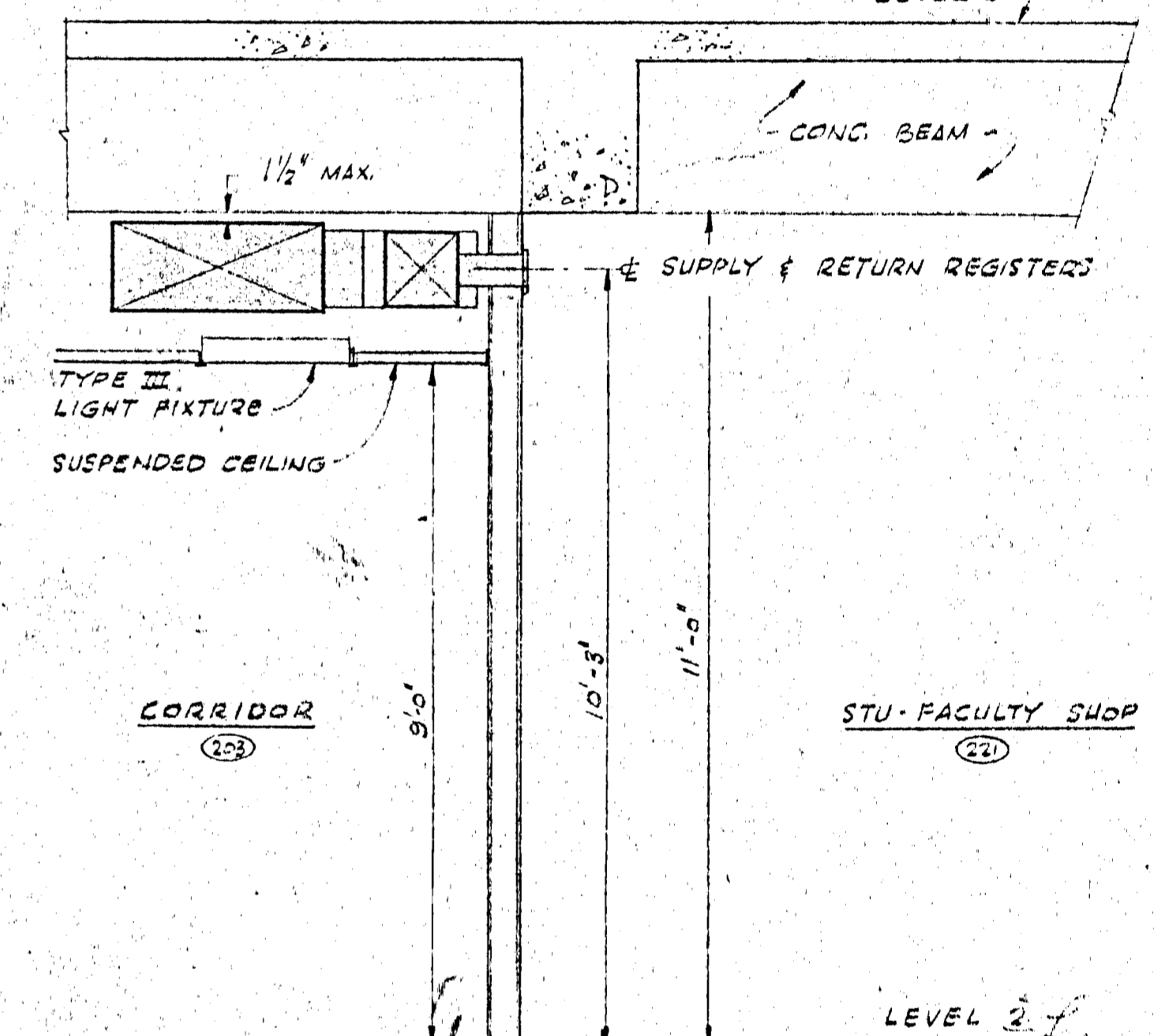
PLAN - LEVEL 2
SCALE 1/8" = 1'-0"



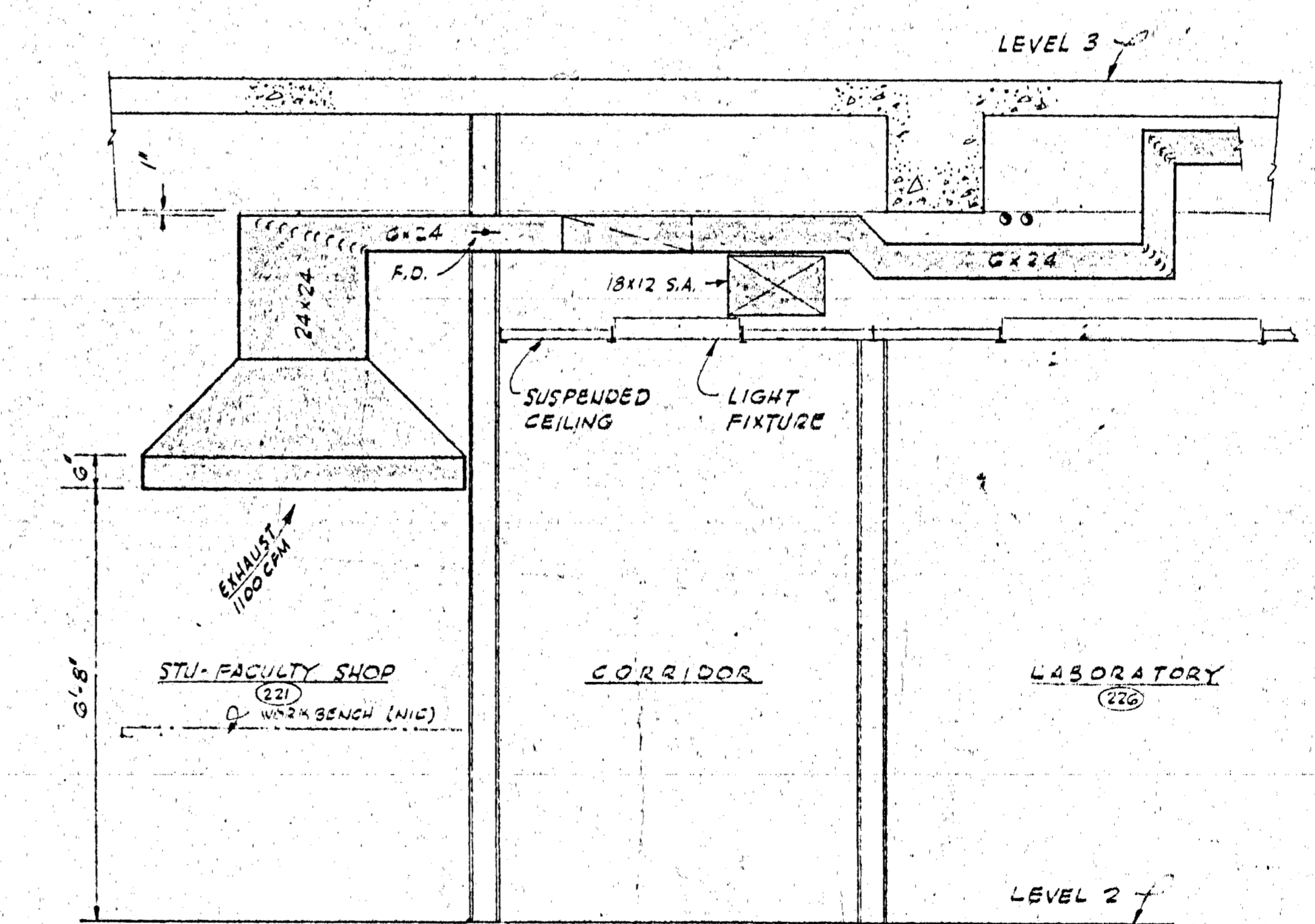
SECTION A
SCALE 1/4" = 1'-0"



SECTION B
SCALE 1/2" = 1'-0"

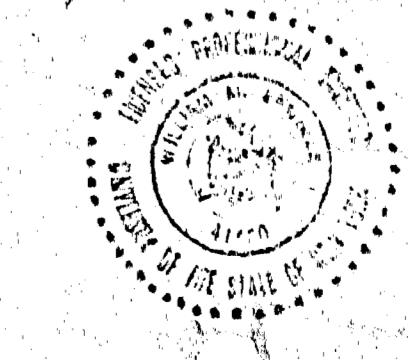


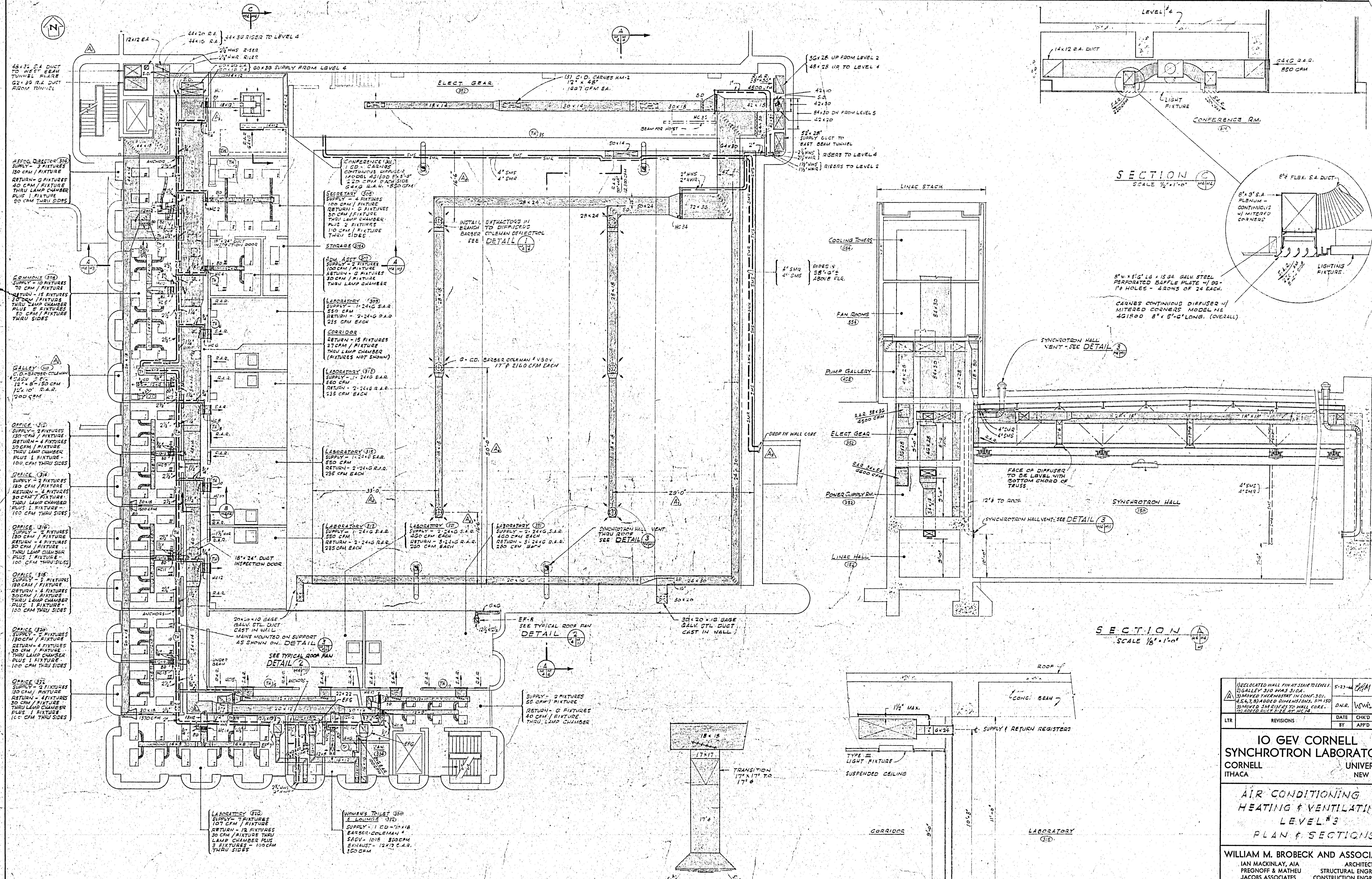
SECTION C
SCALE 1/2" = 1'-0"



SECTION D
SCALE 1/2" = 1'-0"

1) DELETED RISERS AT NW STAIR. 2) CORRECTED WALL AT OFFICE E114. 3) REVISED LIGHTING FOR LAB. 4) REMOVED SM RISERS TO WALL CORE.		5/23/66 G.M.
LTR REVISIONS BY APPD	DATE CHKD APPD	DATE CHKD APPD
10 GEV CORNELL SYNCHROTRON LABORATORY CORNELL UNIVERSITY ITHACA, NEW YORK		
AIR CONDITIONING HEATING & VENTILATING LEVEL #2 PLAN & SECTIONS		
WILLIAM M. BROBECK AND ASSOCIATES IAN MACKINLAY, AIA ARCHITECT PREGNOFF & MATHEU STRUCTURAL ENGR. JACOBS ASSOCIATES CONSTRUCTION ENGR. 950 GILMAN ST. BERKELEY, CALIF. 94710 TELEPHONE 415 - 524 - 8664		
DR. 20856 RELEASED T.H.	CHKD: [Signature] APPROVED LAB NUCLEAR STUDIES	SUPPLY: [Signature] SCALE SHEET 49 OF 102 DRAWING NO.
NOTES 1. FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG 2. INSTALL PIPE CAMBERS		





LEVEL #3
SCALE 1/8" = 1'-0"

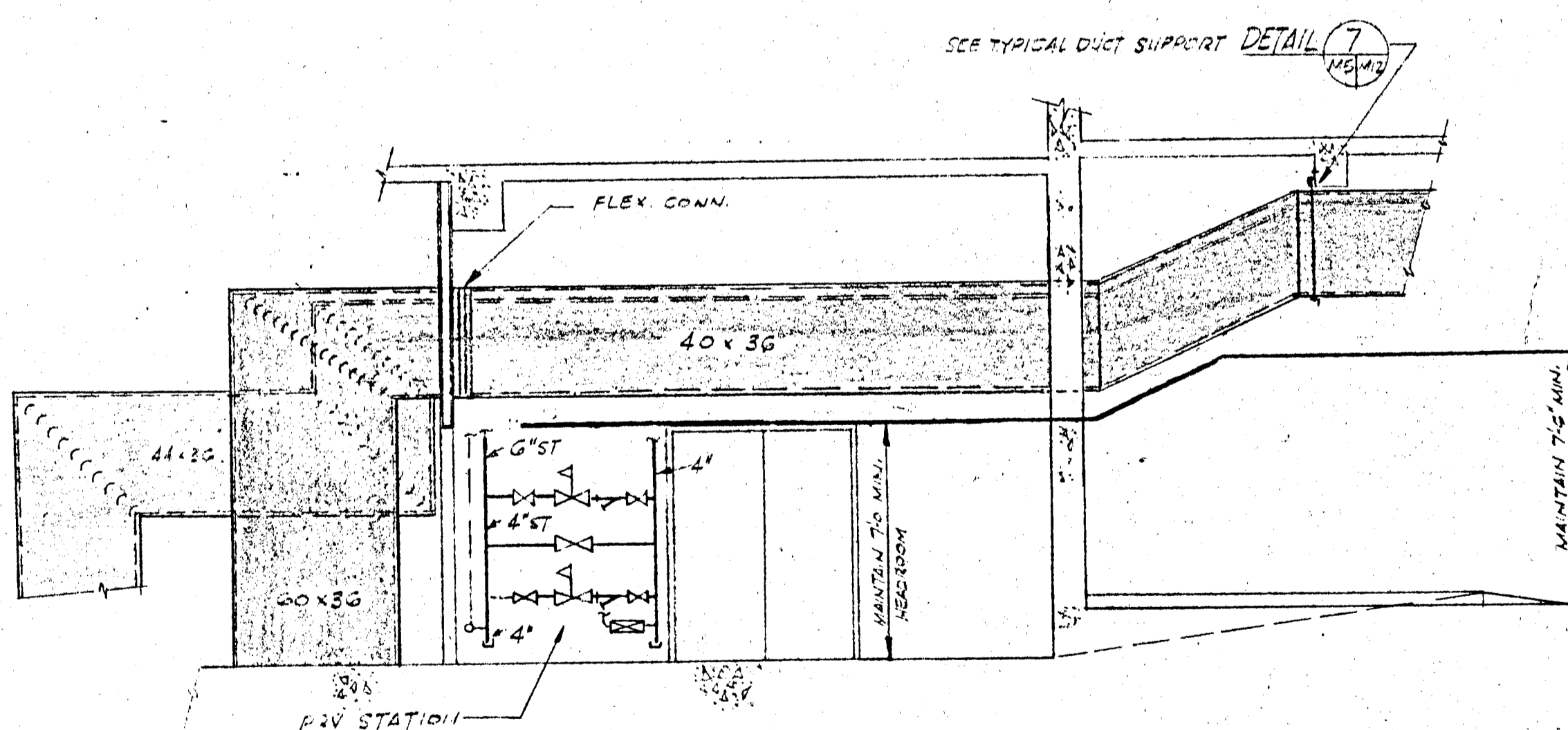
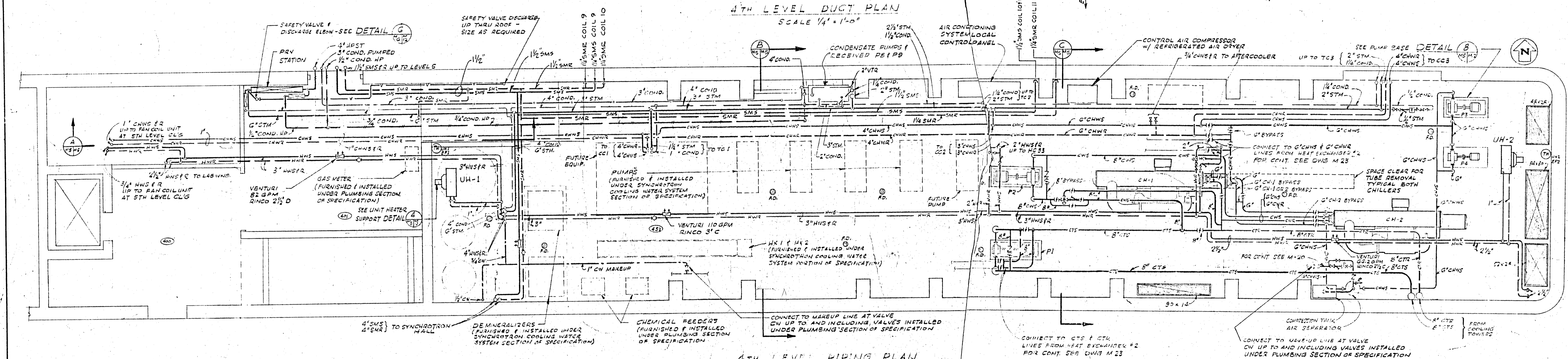
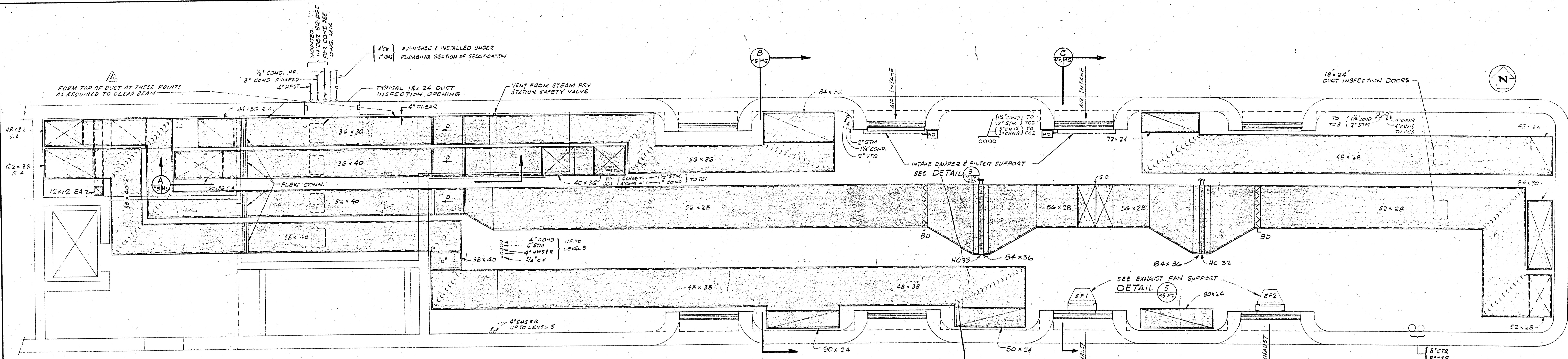
SECTION A
SCALE 1/2" = 1'-0"

SECTION B
SCALE 1/8" = 1'-0"

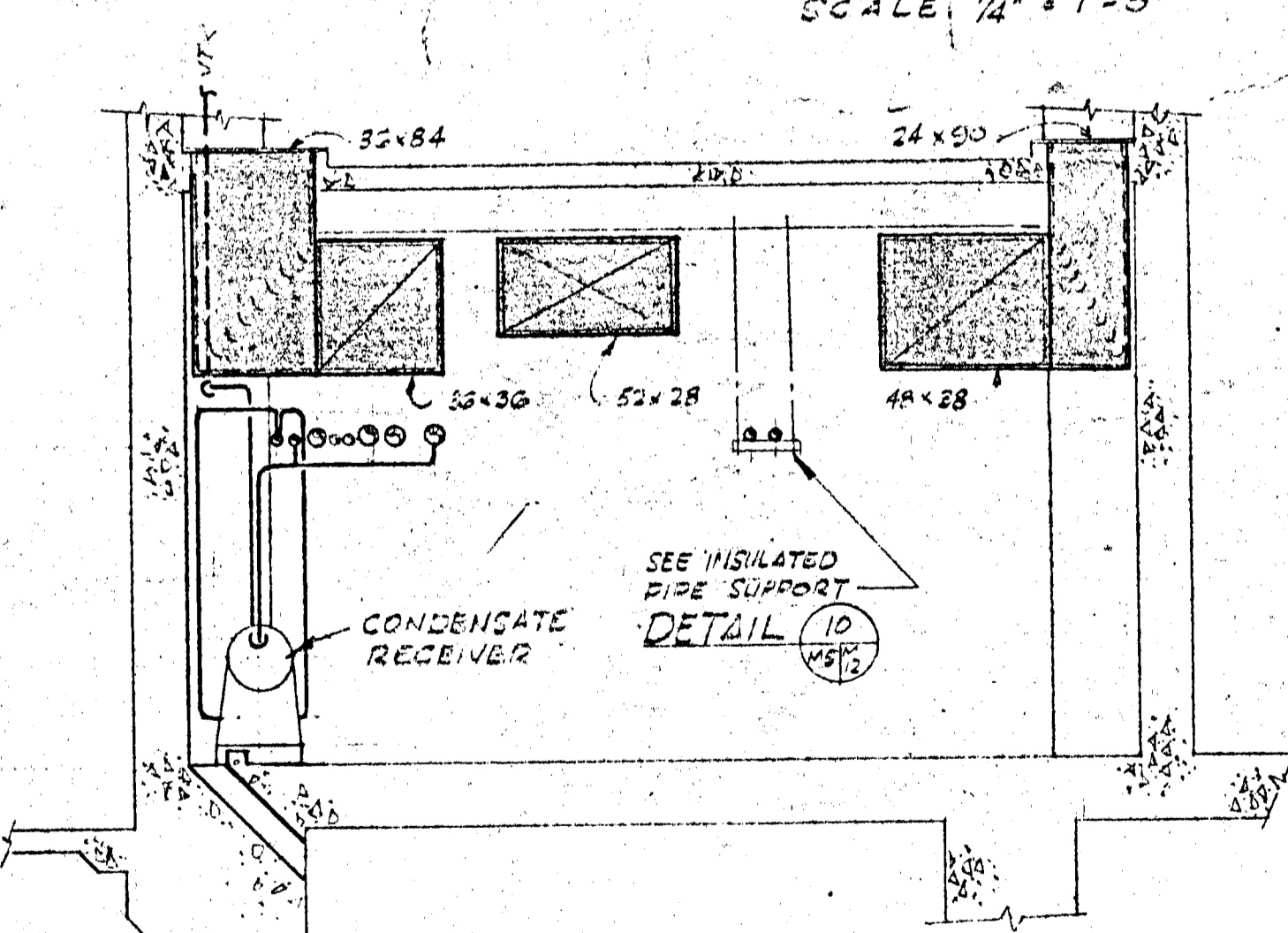
SECTION C
SCALE 1/2" = 1'-0"

- NOTES
- FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWS M-1
 - INSTALL FIRE DAMPERS IN ALL DUCTS AT FLOOR PENETRATIONS.

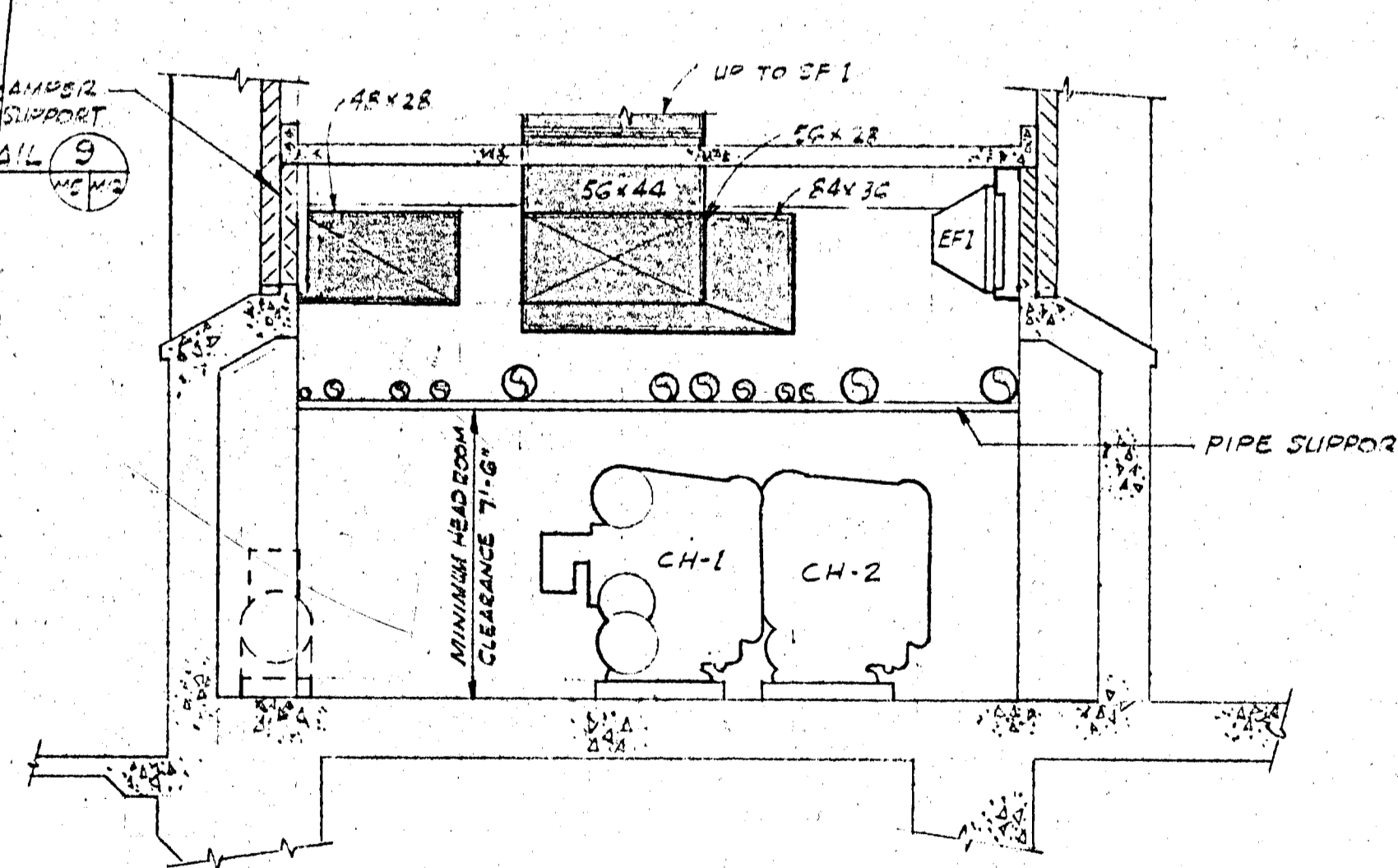
RELOCATED WALL FINISH (SEE DETAIL 1) 2" GALLEY 310 WAS 310A SIMPLIFIED DIMENSIONS IN CONFORM. TO 4.5.7.8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.		5-23-64 WMB DNR WMB
IO GEV CORNELL SYNCHROTRON LABORATORY CORNELL UNIVERSITY ITHACA, NEW YORK	AIR CONDITIONING HEATING & VENTILATING LEVEL #3 PLAN & SECTIONS	
WILLIAM M. BROBECK AND ASSOCIATES IAN MACKINLAY, AIA ARCHITECT PREGNOFF & MATHEU STRUCTURAL ENGR. JACOBS ASSOCIATES CONSTRUCTION ENGR. 950 GILMAN ST. BERKELEY, CALIF. 94710 TELEPHONE 415 - 524 - 8664	DR. 20655L CHK. 6011.1 SUP. 6011.1 SCALE NOTED SHEET 50 OF 102 DRAWING NO.	
RELEASED LAB NUCLEAR STUDIES DATE 10/15/83	APPROVED V.P. BUSINESS DATE 10/15/83 WMB & NO. 111.5	
APPROVED FOR CONSTRUCTION		



SECTION A-A
SCALE 1/4" = 1'-0"



SECTION B-B
SCALE 1/4" = 1'-0"



SECTION C-C
SCALE 1/4" = 1'-0"

NOTE
1. FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG 101
2. REFER TO FLOW DIAGRAMS DWGS M8 & M9 FOR ALL VALVES, GAGES, ETC. REQUIRED IN PIPING.
3. INSTALL FIRE DAMPERS IN ALL DUCTS AT FLOOR PENETRATIONS.

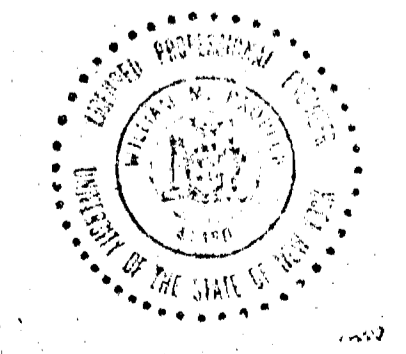
ADDED NOTE TO DUCT IN 4TH LEVEL DUCT PLAN.		5-13-66	GHM
LTR		DNR	WMB
REVISIONS		DATE	CHK'D
		APP'D	APP'D

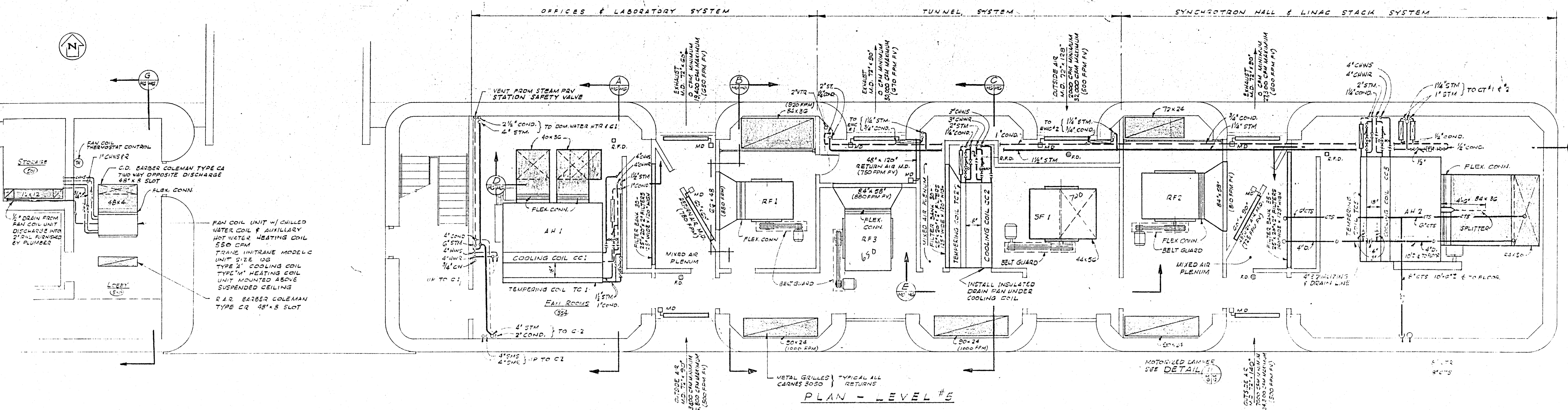
**IO GEV CORNELL
SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA NEW YORK**

**AIR CONDITIONING
HEATING & VENTILATING
LEVEL #4
PLANS & SECTIONS**

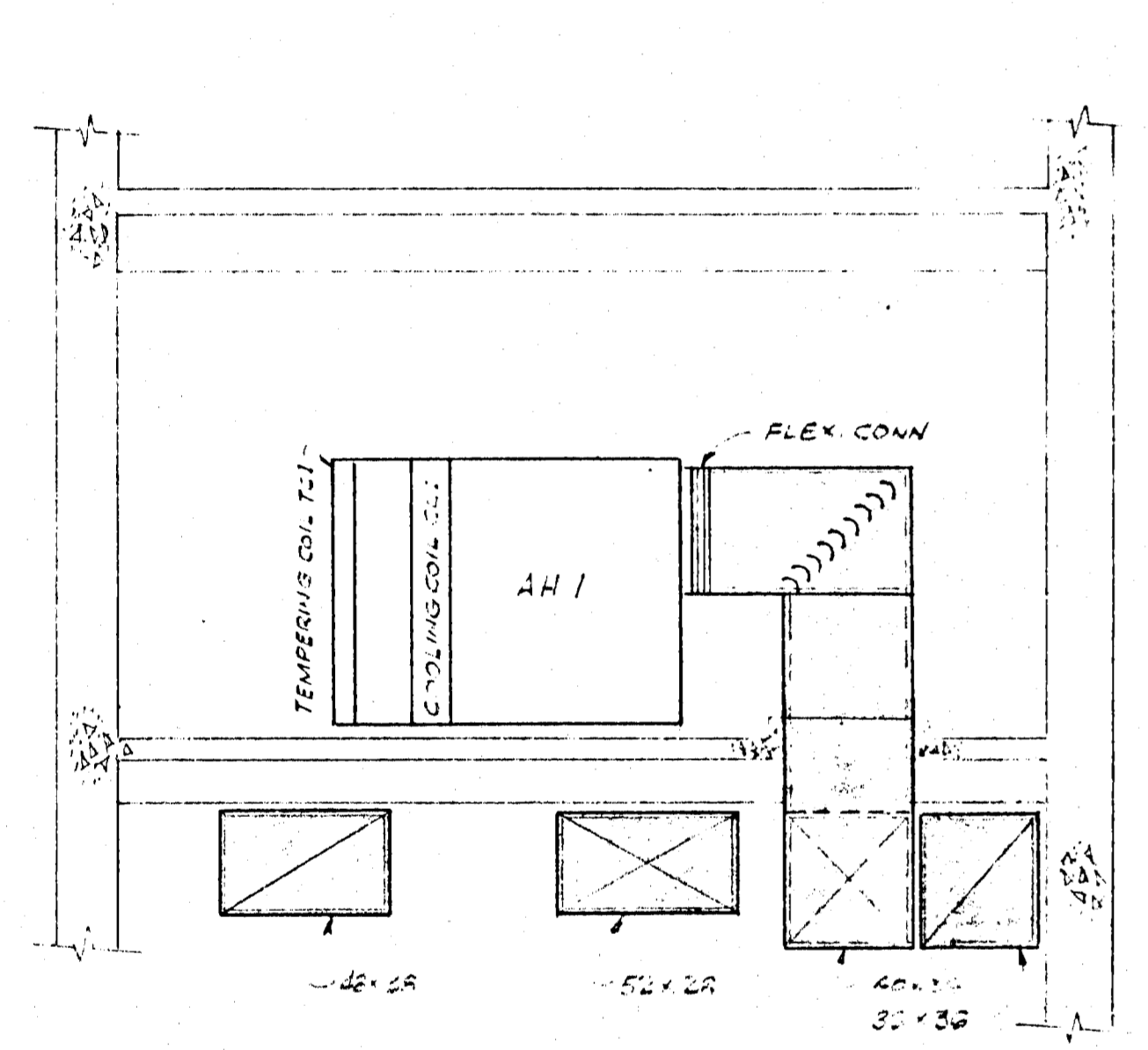
WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
PREGONOFF & MATHEW STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-524-8864

DR. ROESSL	CHK. J. H. H. H.	SUPV. J. H. H. H.	SCALE
RELEASED	APPROVED	LAB NUCLEAR STUDIES	1/4" = 1'-0"
J. H. H. H.	W. M. B.	DATE NOV. 15, 1966	DATE JAN. 16, 1966
APPROVED FOR CONSTRUCTION		M5 WMB & NO. 111-5	

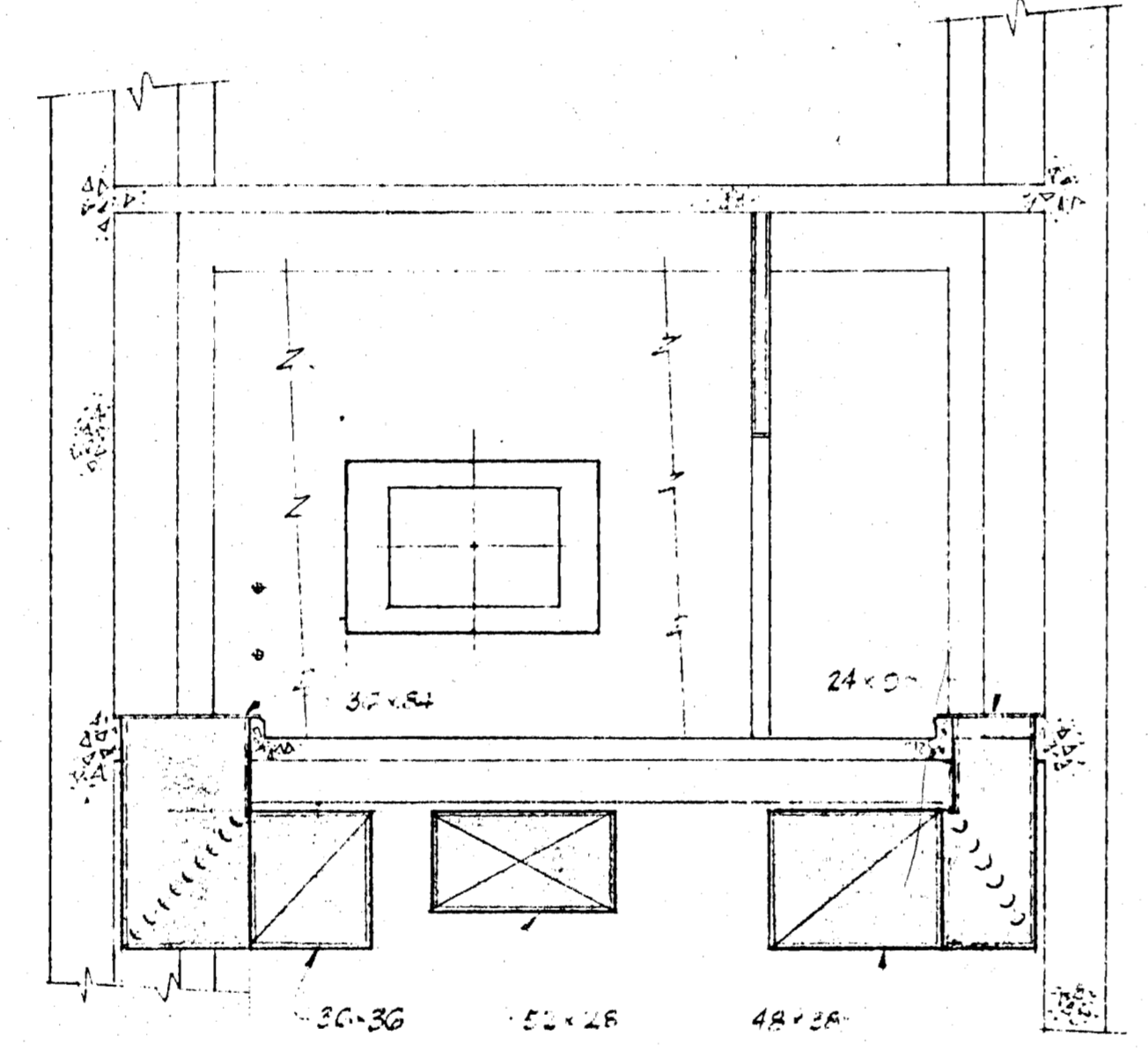




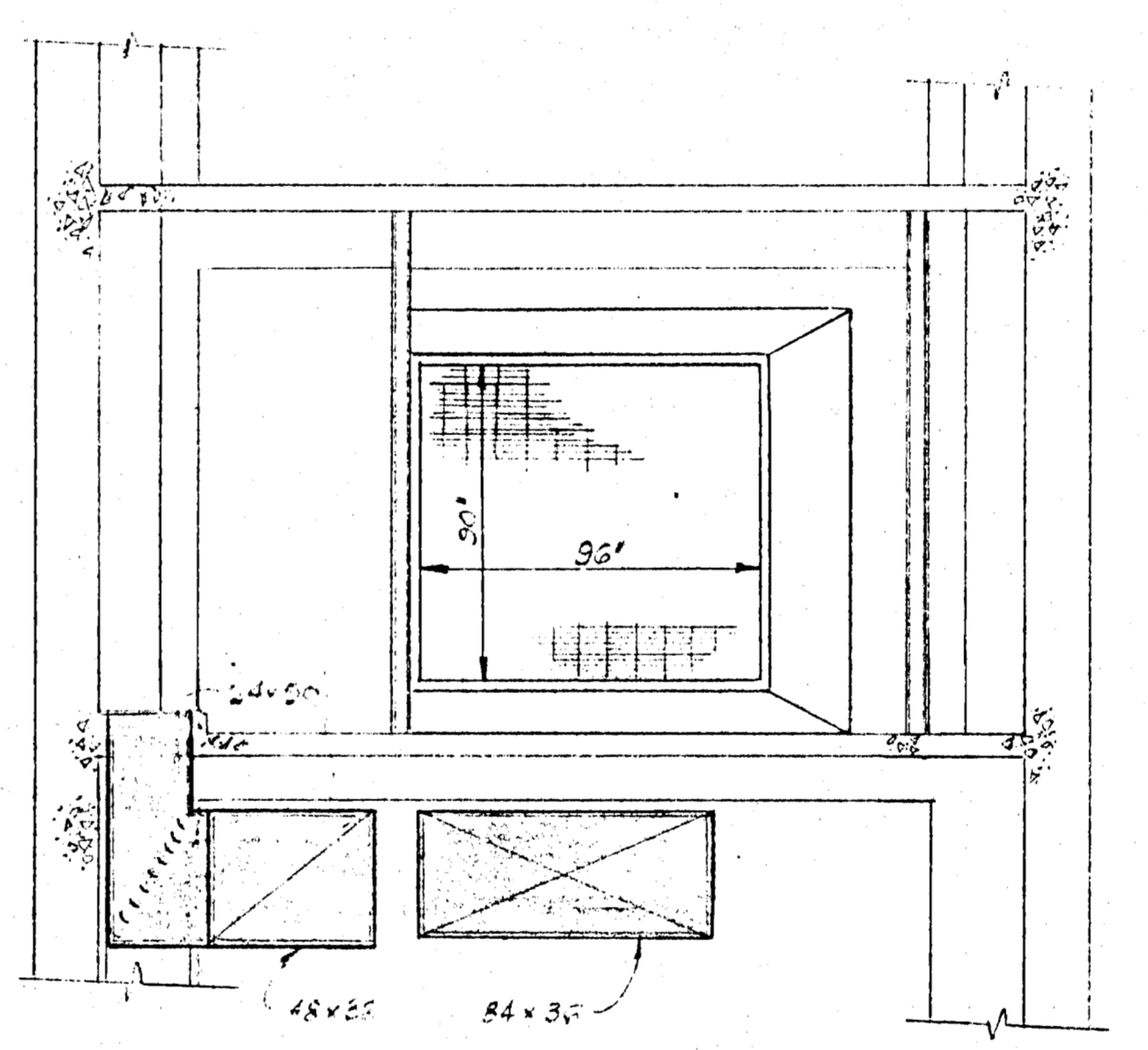
PLAN - LEVEL #5



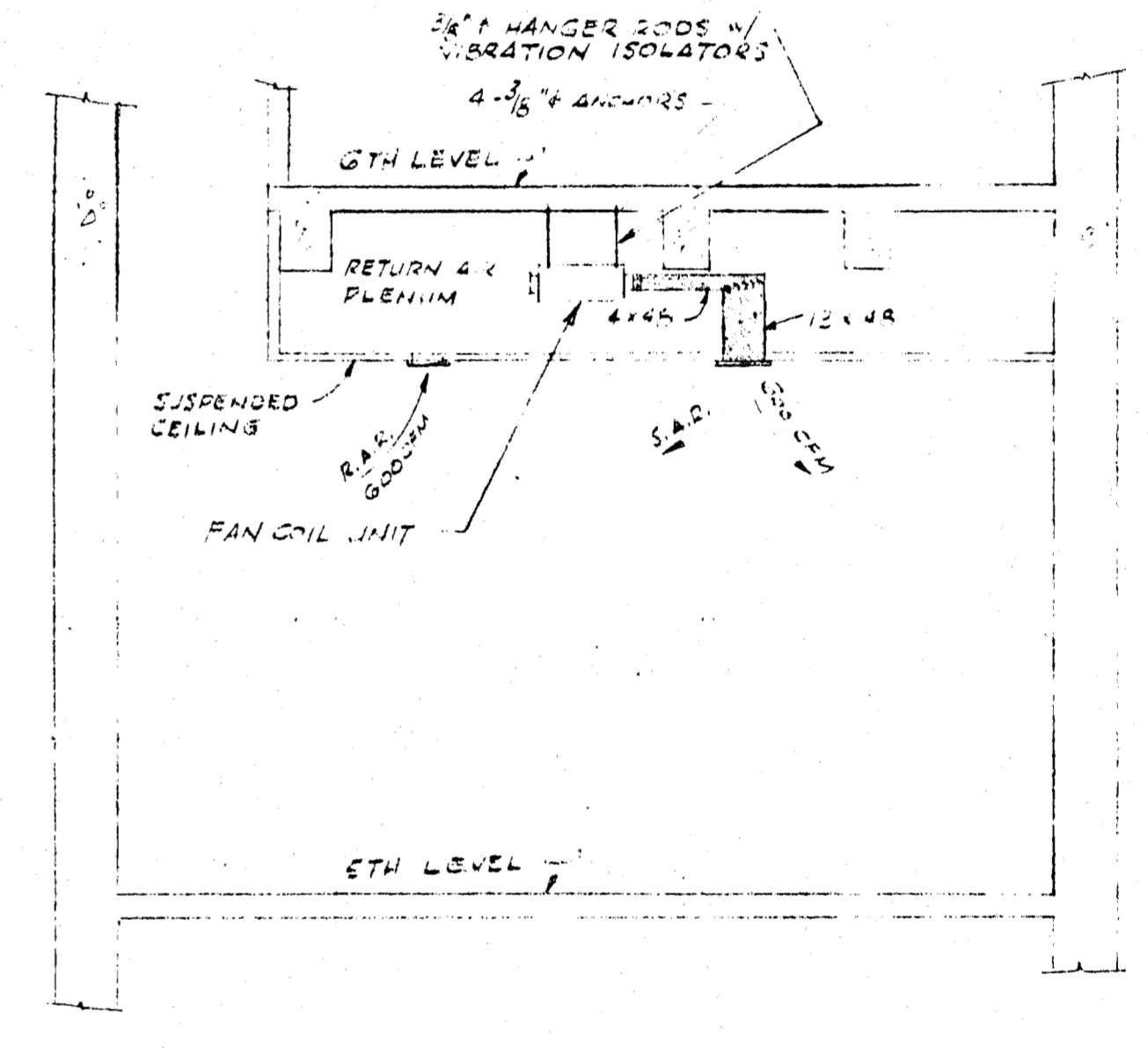
SECTION A



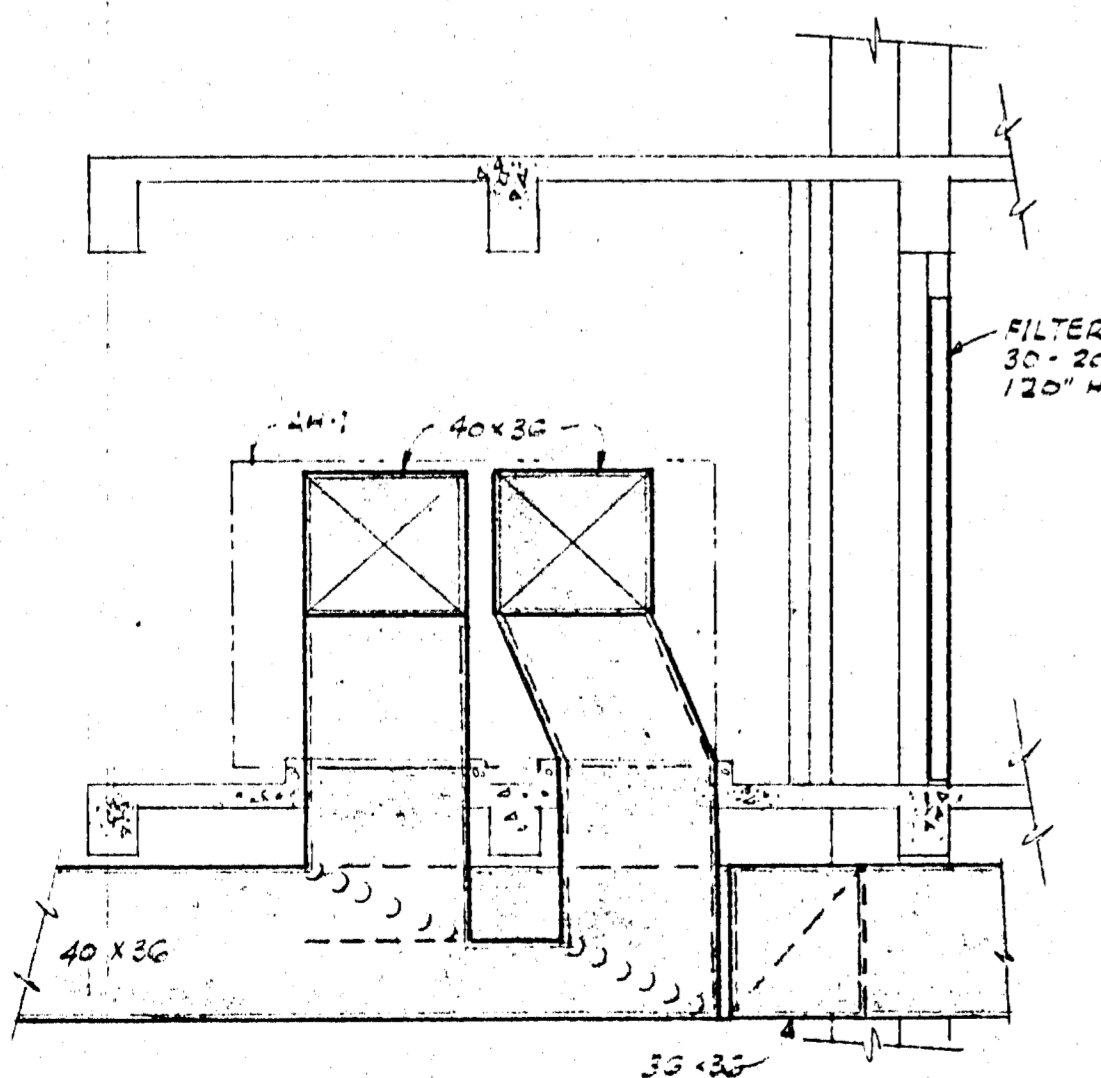
SECTION B



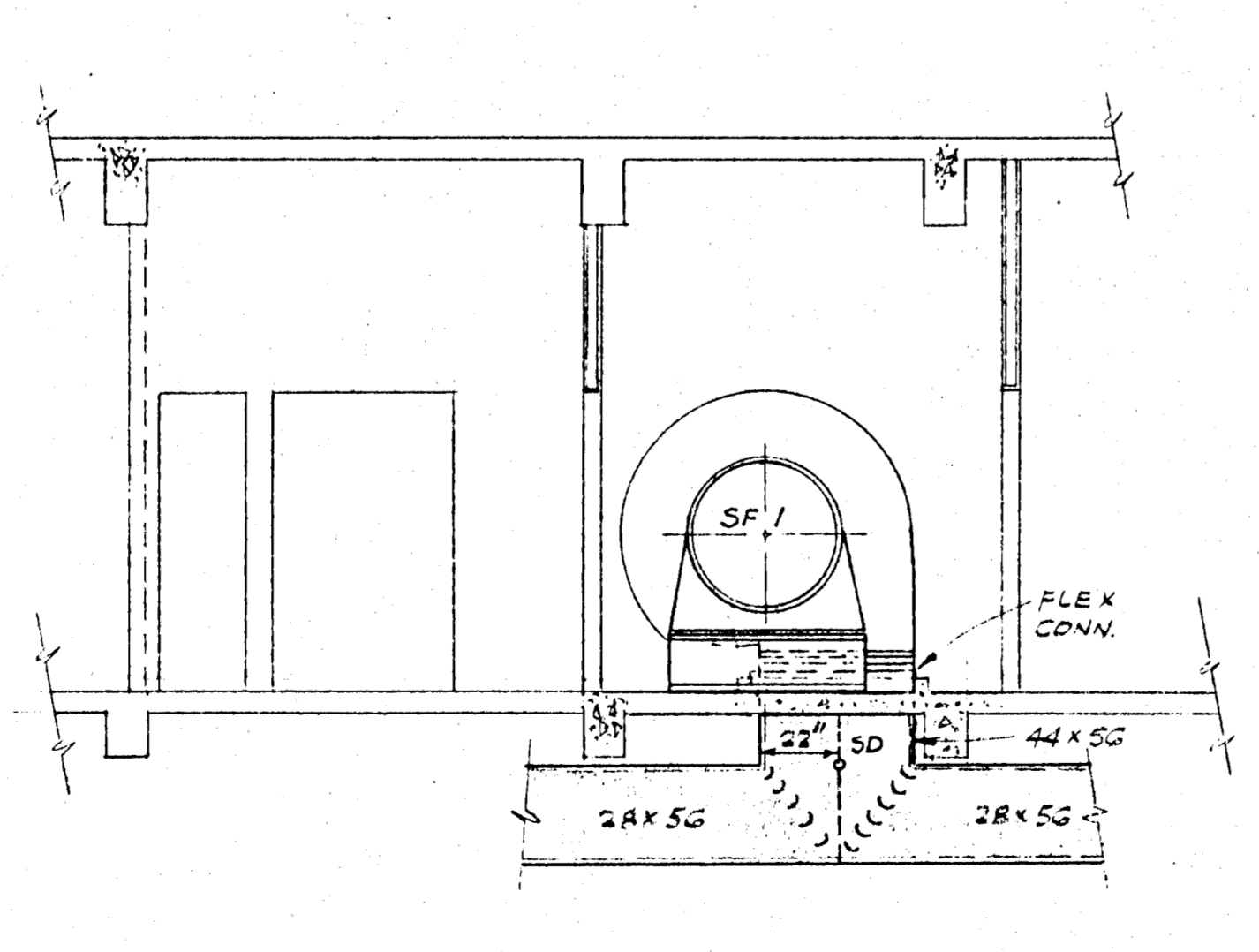
SECTION C



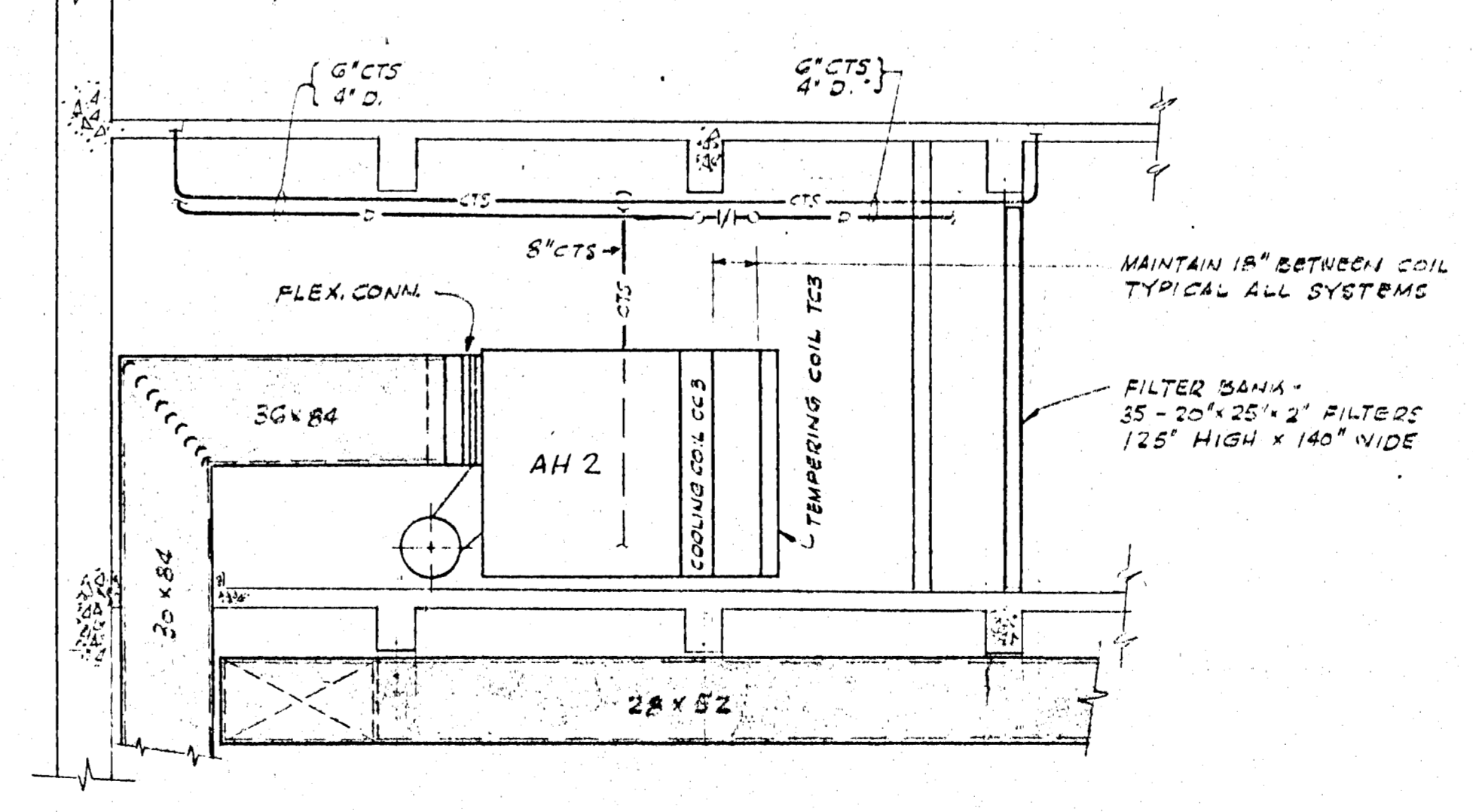
SECTION G



SECTION D



SECTION E



SECTION F

APPROVED FOR CONSTRUCTION

IO GEV CORNELL
SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA NEW YORK

AIR CONDITIONING
HEATING & VENTILATING
LEVEL #5
PLAN & SECTIONS

WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
PREGNOFF & MATHEU STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-524-8864

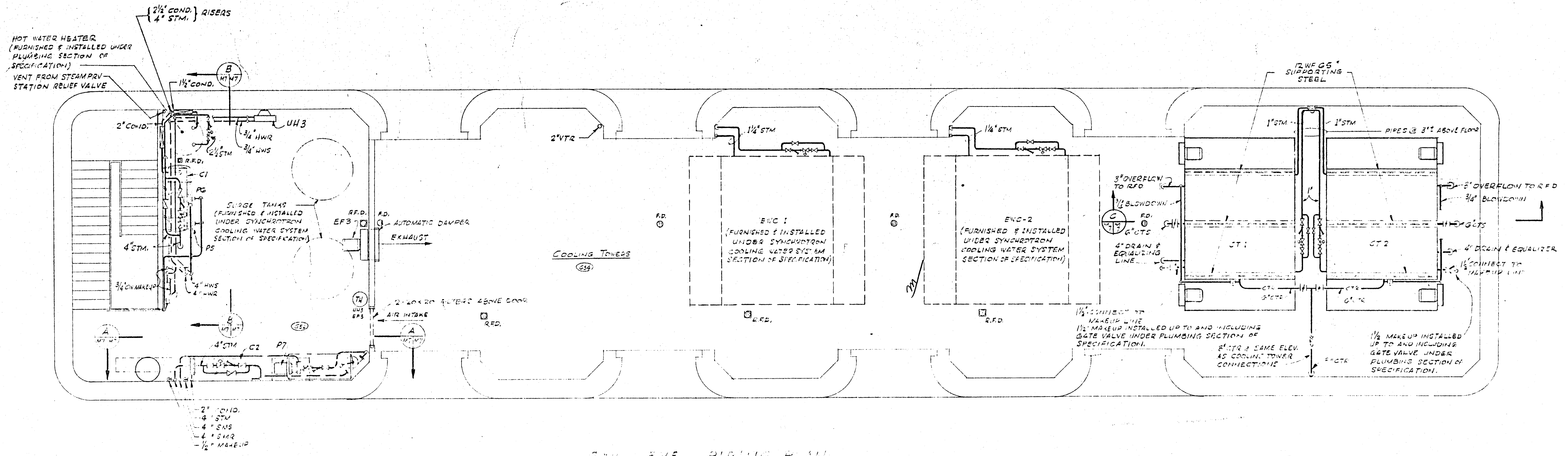
LTR	REVISIONS	DATE	CHKD	APPD

DR. ROSS | CHK. M. H. | SUPV. W. J. | SCALE 1/4" = 1'-0"

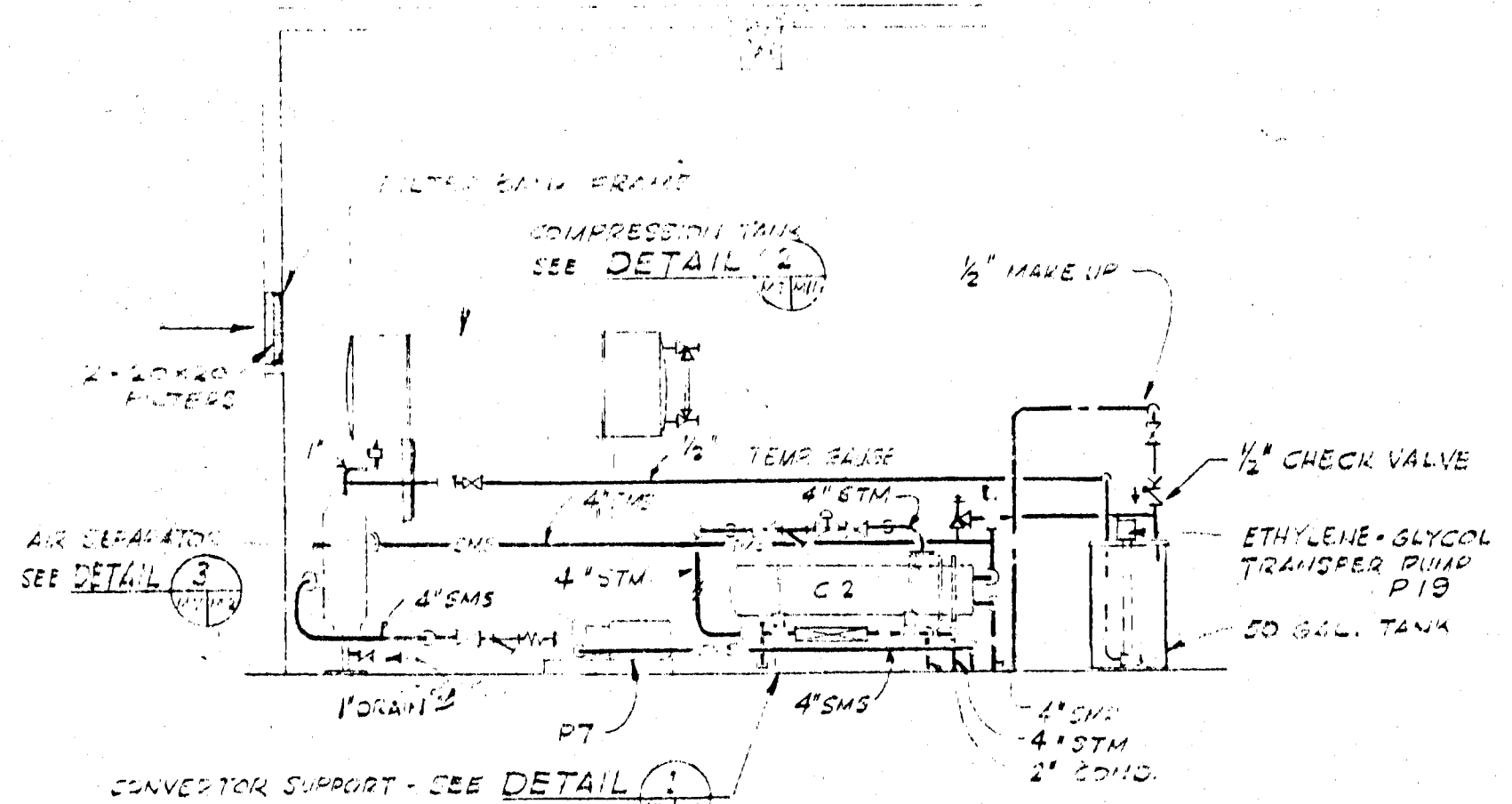
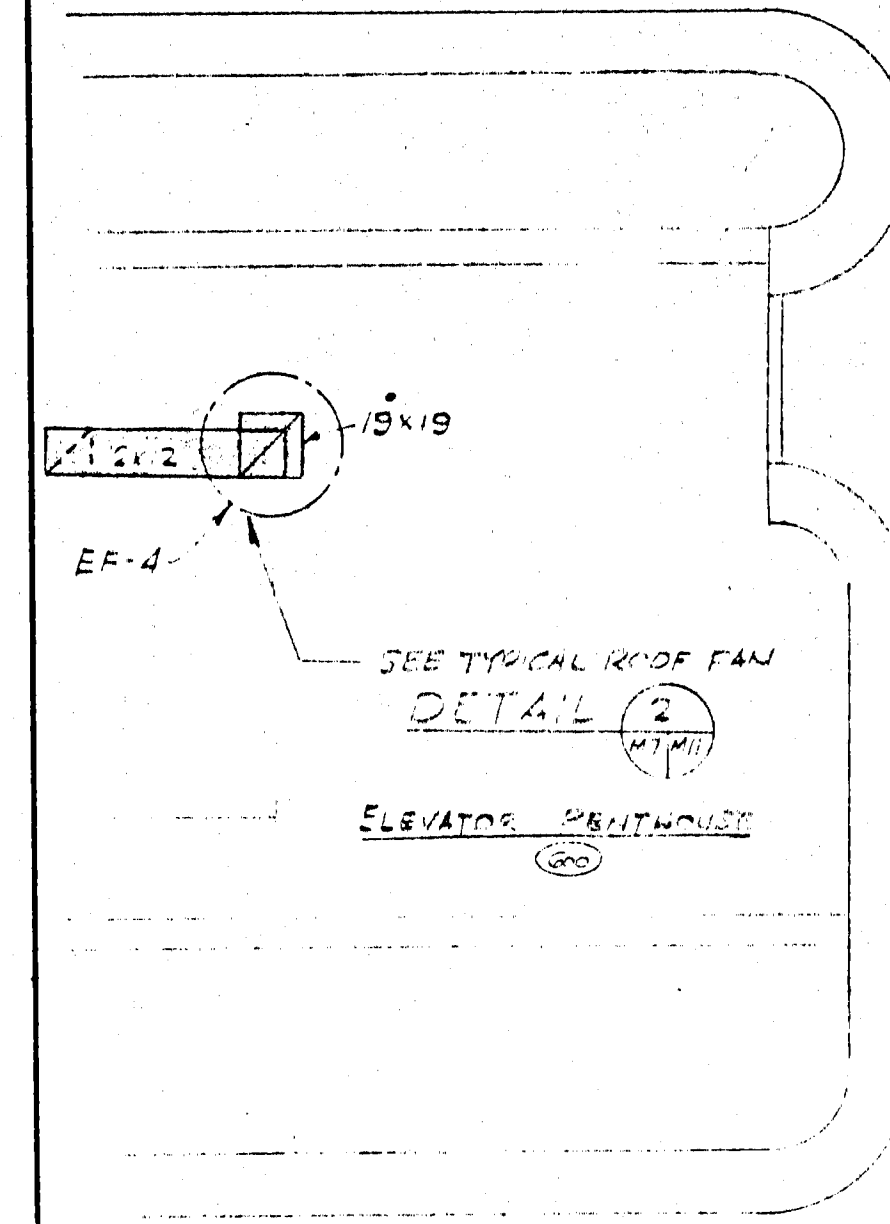
RELEASED	APPROVED	SHEET 52	OF 102
LAB NUCLEAR STUDIES		DRAWING NO. M/G	
DATE NOV. 16, 1966		DATE JAN. 15, 1966	

WMB & A NO. 1115

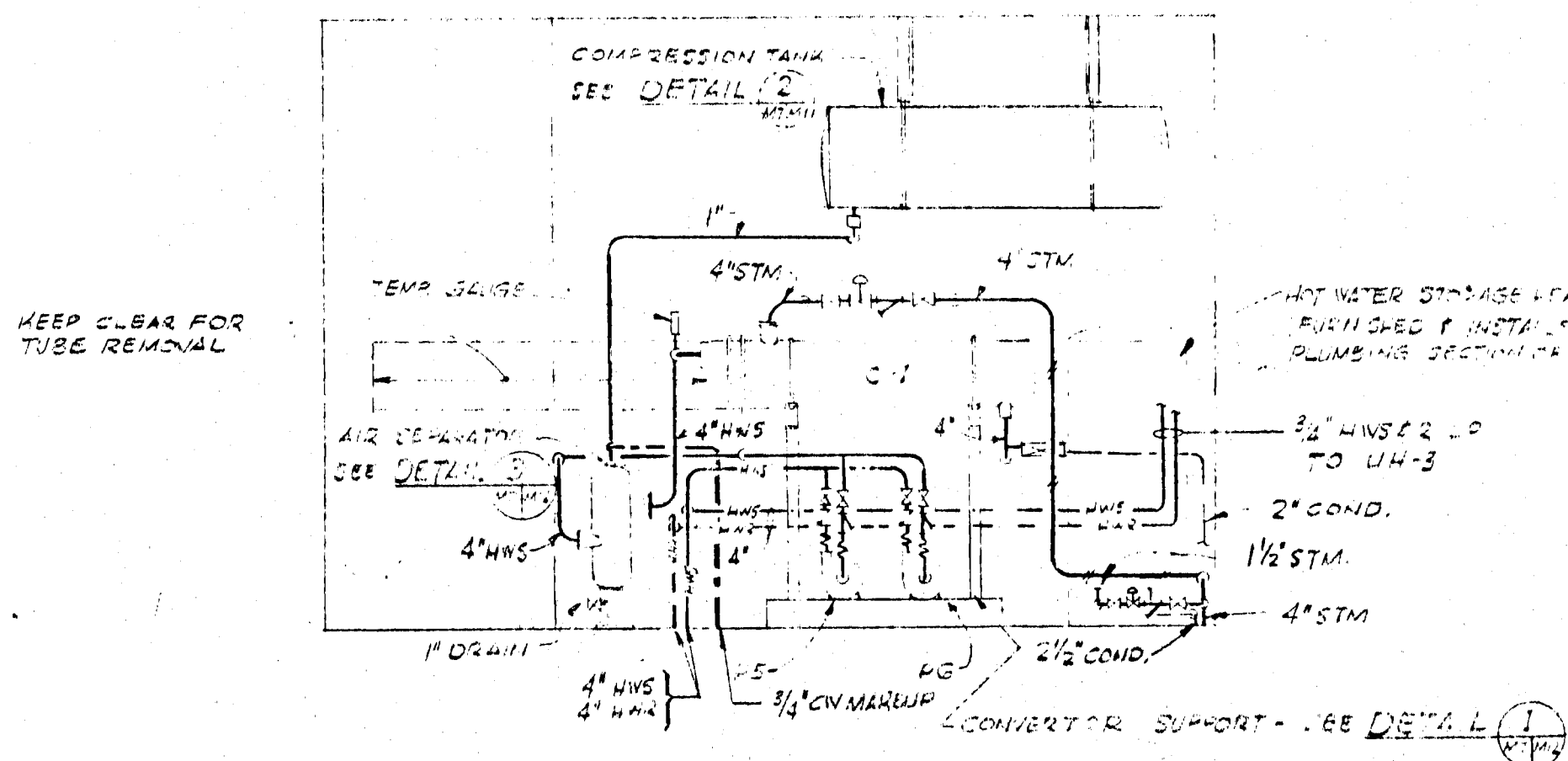
NOTES
1. FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG. M1.
2. RUN 1" DRAIN PIPES FROM ALL COOLING COIL DRAIN DAVIS & DISCHARGE TO NEAREST FLOOR DRAIN. INSTALL TRAP IN DRAIN.



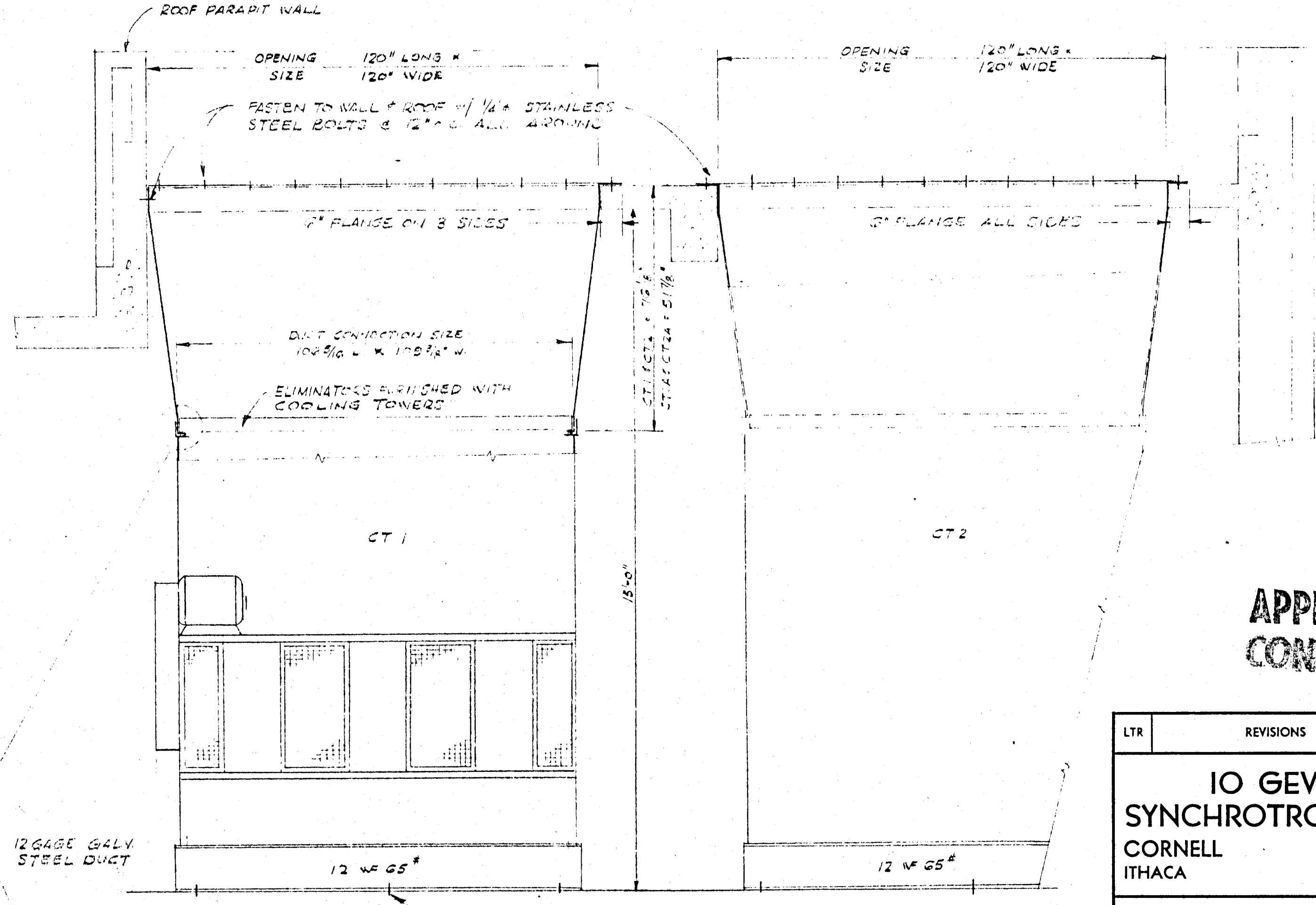
6TH LEVEL PIPING PLAN
SCALE 1/8" = 1'-0"



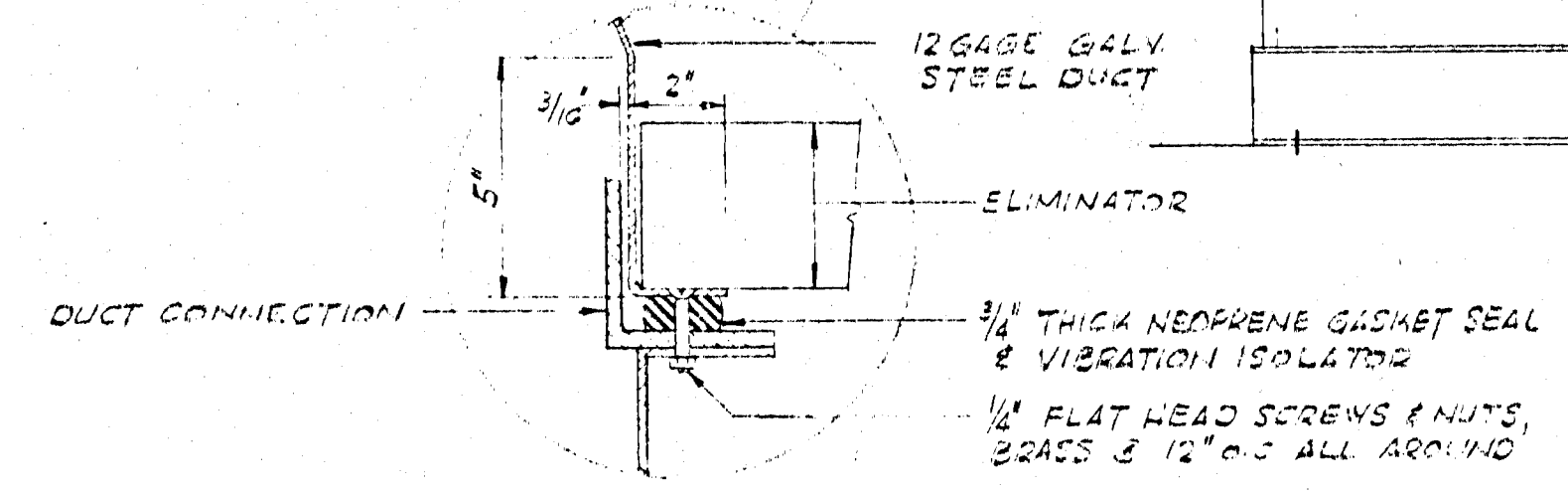
SECTION A
SCALE 1/4" = 1'-0"



SECTION B
SCALE 1/4" = 1'-0"



SECTION C
SCALE 1/2" = 1'-0"



APPROVED FOR CONSTRUCTION

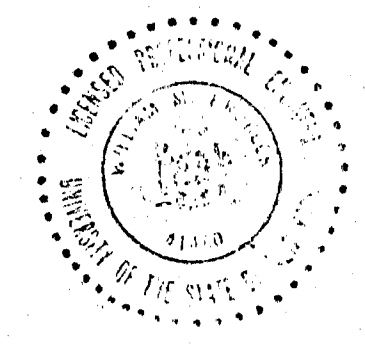
**IO GEV CORNELL
SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA NEW YORK**

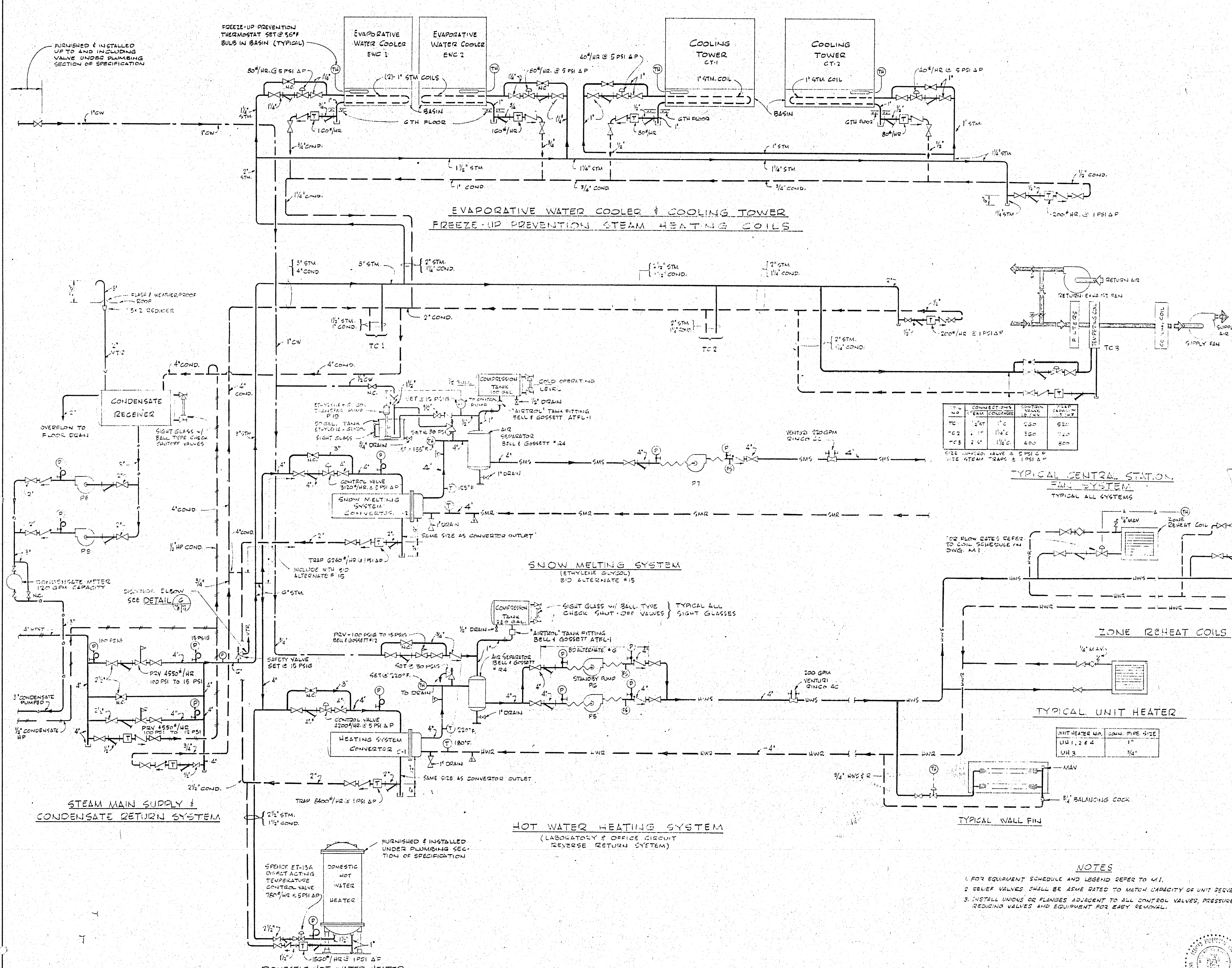
**AIR CONDITIONING
HEATING & VENTILATING
LEVEL #6
PLAN & SECTIONS**

WILLIAM M. BROBECK AND ASSOCIATES.
IAN MACKINLAY, AIA ARCHITECT
PREGNOFF & MATHEU STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415 - 524 - 8664

DR.	CHK'D	SUPV.	SCALE
DR. ROESSL	CHK'D [Signature]	SUPV. [Signature]	SCALE NOTED
RELEASED	APPROVED	SHEET 53	OF 102
[Signature]	LAB NUCLEAR STUDIES	DRAWING NO.	
[Signature]	V.P. BUSINESS	[Signature]	M7
DATE NOV. 15, 1972	DATE JAN. 15, 1973	WMB & A NO. 111-5	

NOTE
1. FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG. M1
2. REFER TO FLOW DIAGRAMS DWGS M8 & M9 FOR ALL VALVES, GAGES, ETC. REQUIRED IN PIPING.



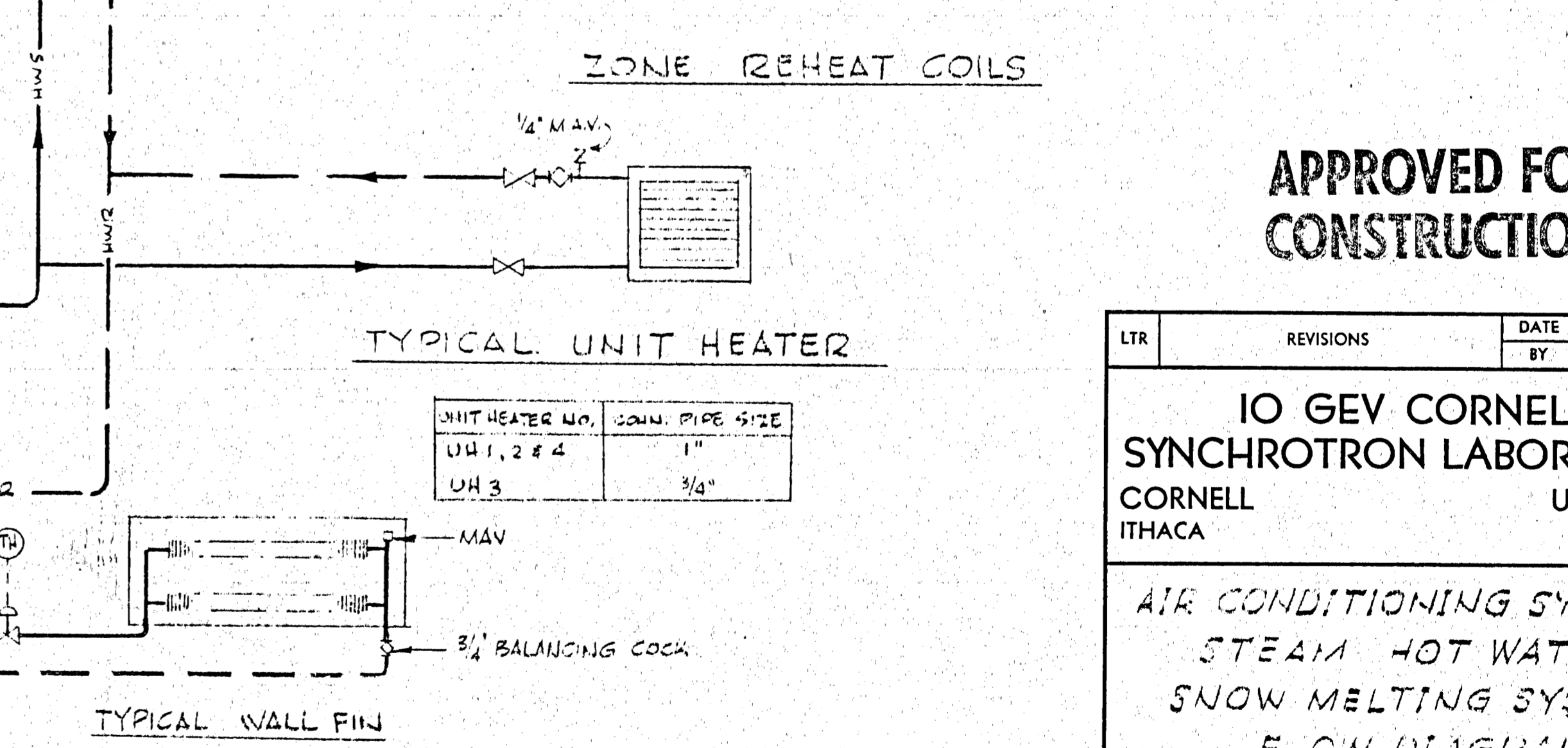
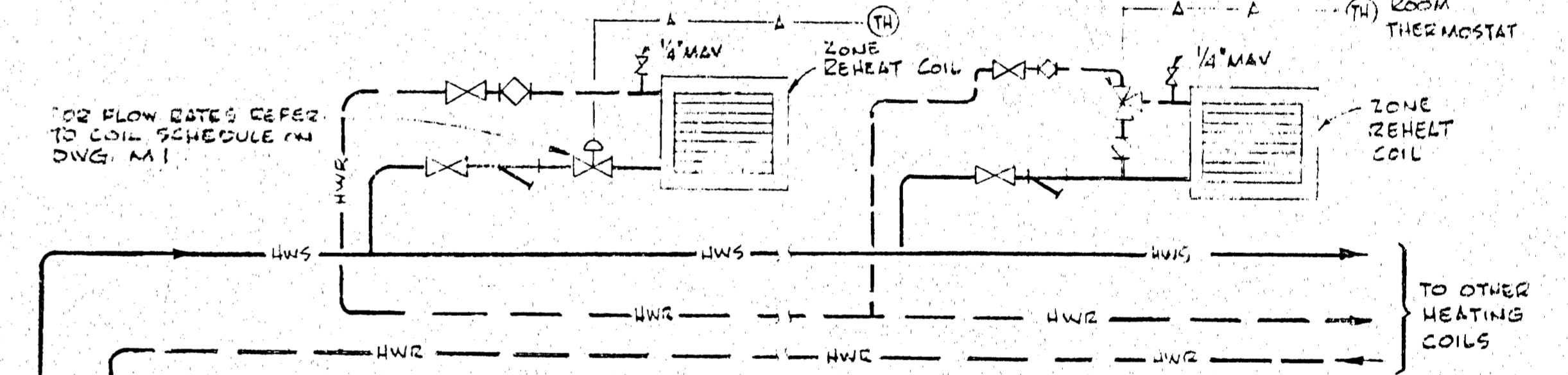


- ### LEGEND
- LOW PRESSURE STEAM
 - - - LOW PRESSURE CONDENSATE RETURN
 - HIGH PRESSURE STEAM
 - - - HIGH PRESSURE CONDENSATE RETURN
 - PUMP CONDENSATE RETURN
 - ELECTRICAL CONTROL WIRING
 - GATE VALVE
 - CHECK VALVE
 - CONTROL VALVE
 - THERMOMETER
 - PRESSURE GAUGE
 - THERMOSTAT
 - STRAINER
 - FLOW DIRECTION
 - THERMOSTAT BULB IN BASIN
 - FLOW SWITCH
 - BALANCING COCK
 - DIRT LEG
 - PRESSURE SWITCH
 - FLEXIBLE CONNECTION
 - PRESSURE RELIEF VALVE
 - PRESSURE REDUCING VALVE PRV
 - STEAM TRAP
 - SMS- SNOW MELTING SYSTEM SUPPLY
 - SMR- SNOW MELTING SYSTEM RETURN
 - HWS- HOT WATER HEATING SYSTEM SUPPLY
 - HWR- HOT WATER HEATING SYSTEM RETURN
 - RIMP (END SUCTION TYPE)
 - TANK AIRTIGHT FITTING
 - CAMPUS WATER (TREATED) CW
 - VENTURI
 - THERMOCOUPLE WELL
 - M.V. MANUAL AIR VENT
 - V.T. VENT TANK ZONE
 - G.V. GLOBE VALVE
 - Δ P DIFFERENCE IN PRESSURE INLET TO OUTLET

NO.	CONNECTING TANK CONDENSATE	CONDENSATE RETURN	STEAM
TC 1	1 1/2"	1"	1"
TC 2	1 1/2"	1"	1"
TC 3	2 1/2"	1 1/2"	1 1/2"

SEE CONTROL VALVE & 5 PSI Δ P
USE STEAM TRAPS & 1 PSI Δ P

TYPICAL CENTRAL STATION
TYPICAL ALL SYSTEMS



TYPICAL UNIT HEATER
TYPICAL WALL FIN

- ### NOTES
- FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO M.I.
 - RELIEF VALVES SHALL BE ASME RATED TO MATCH CAPACITY OF UNIT SERVED.
 - INSTALL UNIONS OR FLANGES ADJACENT TO ALL CONTROL VALVES, PRESSURE REDUCING VALVES AND EQUIPMENT FOR EASY REMOVAL.

APPROVED FOR CONSTRUCTION

DATE	CHKD	APPD
NOV 15 1966	W.M.B.	W.M.B.

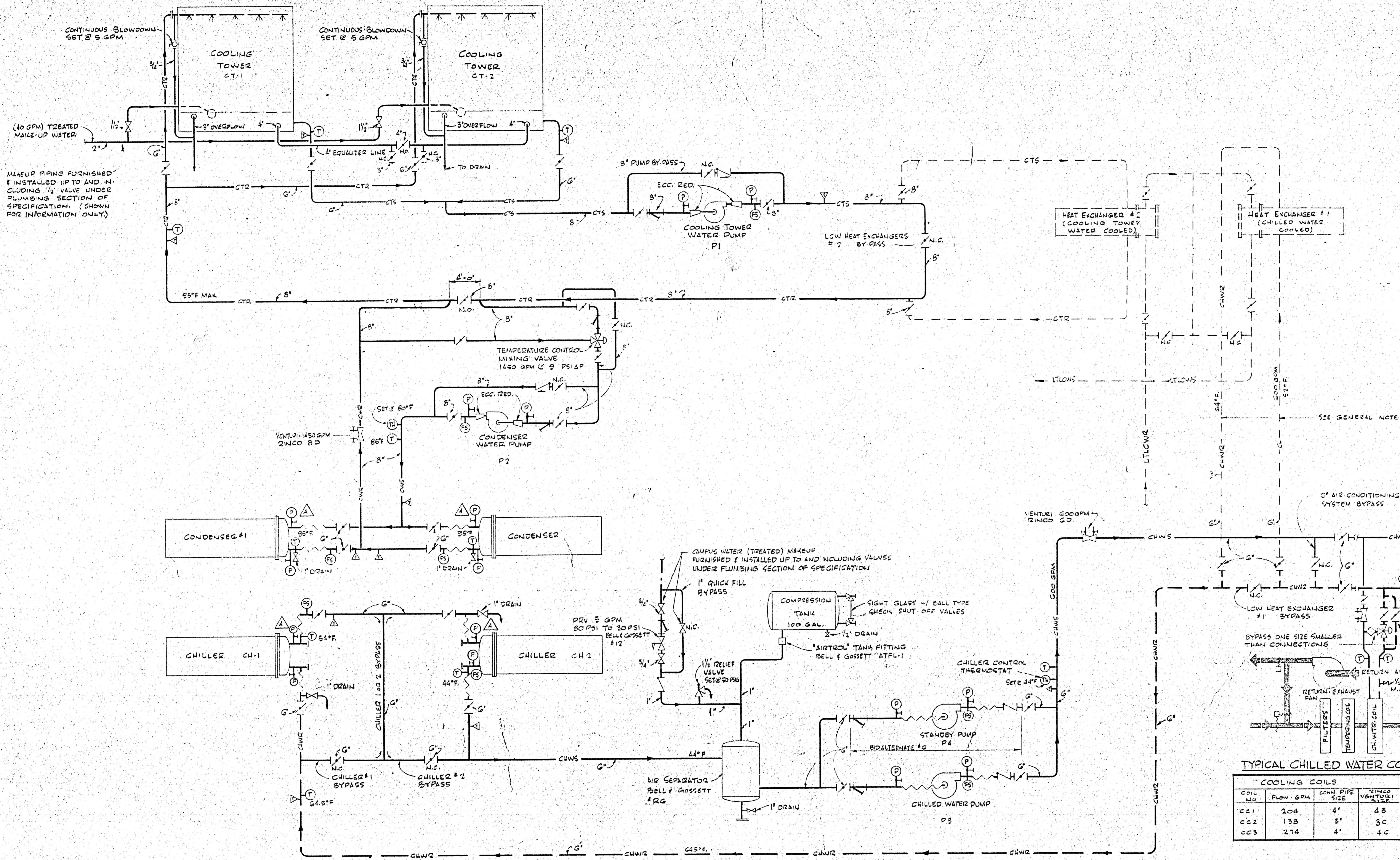
IO GEV CORNELL SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA, NEW YORK

AIR CONDITIONING SYSTEM, STEAM HOT WATER & SNOW MELTING SYSTEMS FLOW DIAGRAM

WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
PREGNOFF & MATHEU STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-524-8664

RELEASED	APPROVED	SHEET	OF
T.H.C.	LAB NUCLEAR STUDIES	54	102

DATE NOV 15, 1966 DATE JAN 15, 1966 WMB & NO. 1115



MAKEUP PIPING FURNISHED & INSTALLED UP TO AND INCLUDING 1/2" VALVE UNDER PLUMBING SECTION OF SPECIFICATION. (SHOWN FOR INFORMATION ONLY)

- LEGEND**
- CTS - COOLING TOWER SUPPLY
 - CTR - COOLING TOWER RETURN
 - CWS - CHILLED WATER SUPPLY
 - CWR - CHILLED WATER RETURN
 - LTCS - LOW TEMP, LOW CONDUCTIVITY WATER SUPPLY
 - LTR - LOW TEMP, LOW CONDUCTIVITY WATER RETURN
 - GATE VALVE
 - CHECK VALVE
 - PRESSURE GAUGE
 - THERMOMETER
 - FLOW SWITCH
 - STRAINER
 - ECCENTRIC REDUCER
 - THERMOSTAT
-
- N.C. - NORMALLY CLOSED
 - PRV - PRESSURE REDUCING VALVE
 - FC - FLEXIBLE CONNECTION
 - PRV - PRESSURE RELIEF VALVE
 - P - PUMP
 - BC - BALANCING COCK
 - CAMPUS WATER (TREATED)
 - TW - THERMOCOUPLE WELL
 - BV - BUTTERFLY VALVE
 - V - VENTURI (FOR BALANCING FLOW) RING OR APPROX EQUAL MAU
 - MAU - MAXIMUM AIR VELOCITY

- GENERAL NOTES**
1. ALL PIPING AND HEAT EXCHANGERS FOR THE LOW COOLING SYSTEM FURNISHED AND INSTALLED UNDER THE SYNCHROTRON COOLING WATER SYSTEM SECTION OF THE SPECIFICATION, SECTION V.
 2. FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG. M.I.
 3. CHILLER - MAKE ALL WATER CONNECTIONS TO OIL COOLER AND SUCH OTHER WATER & DRAIN CONNECTIONS AS REQUIRED.

TYPICAL CHILLED WATER COIL HOOK-UP

COOLING COILS			
COIL No.	FLOW - GPM	CONN. PIPE SIZE	TRIMMED VENTURI
CC1	204	4"	4B
CC2	138	3"	3C
CC3	274	4"	4C

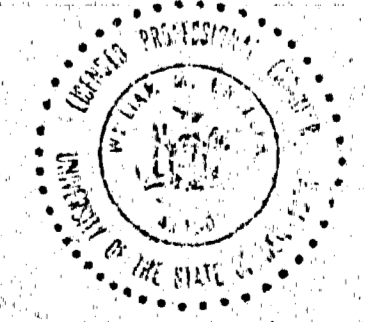
APPROVED FOR CONSTRUCTION

SEE ADDENDUM 1	DATE	CHKD	APPD
LTR	REVISIONS	BY	APPD

IO GEV CORNELL SYNCHROTRON LABORATORY
 CORNELL UNIVERSITY
 ITHACA NEW YORK

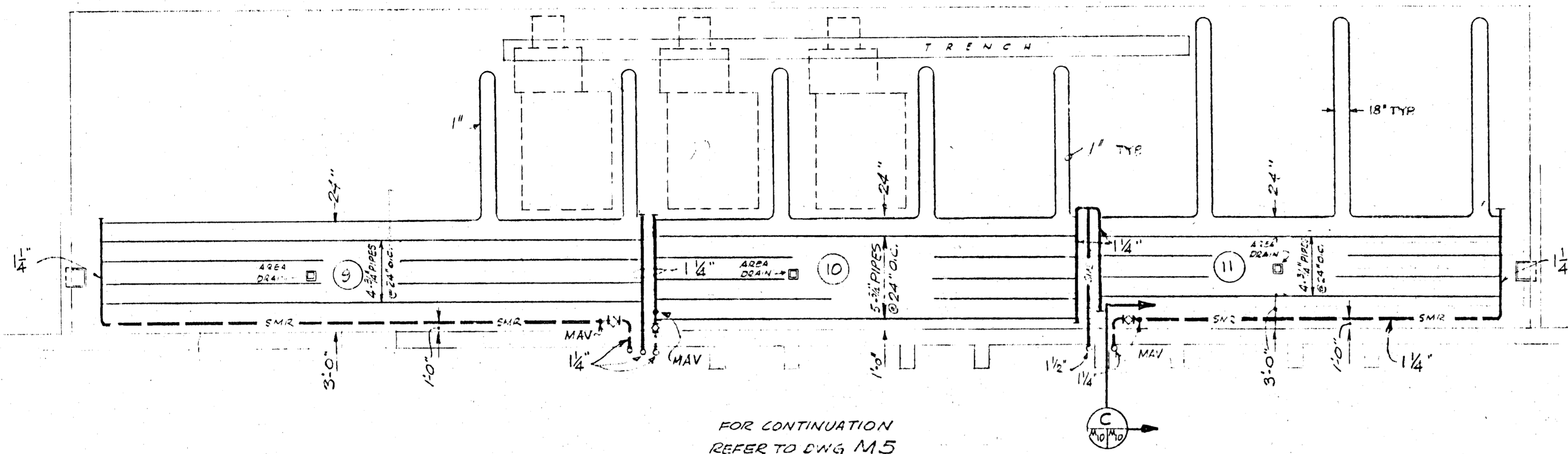
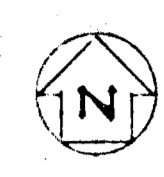
AIR CONDITIONING SYSTEM CHILLED WATER, COOLING TOWER & CONDENSER WATER FLOW DIAGRAM

WILLIAM M. BROBECK AND ASSOCIATES
 IAN MACKINLAY, AIA ARCHITECT
 PREGNOFF & MATHEU STRUCTURAL ENGR.
 JACOBS ASSOCIATES CONSTRUCTION ENGR.
 950 GILMAN ST. BERKELEY, CALIF. 94710
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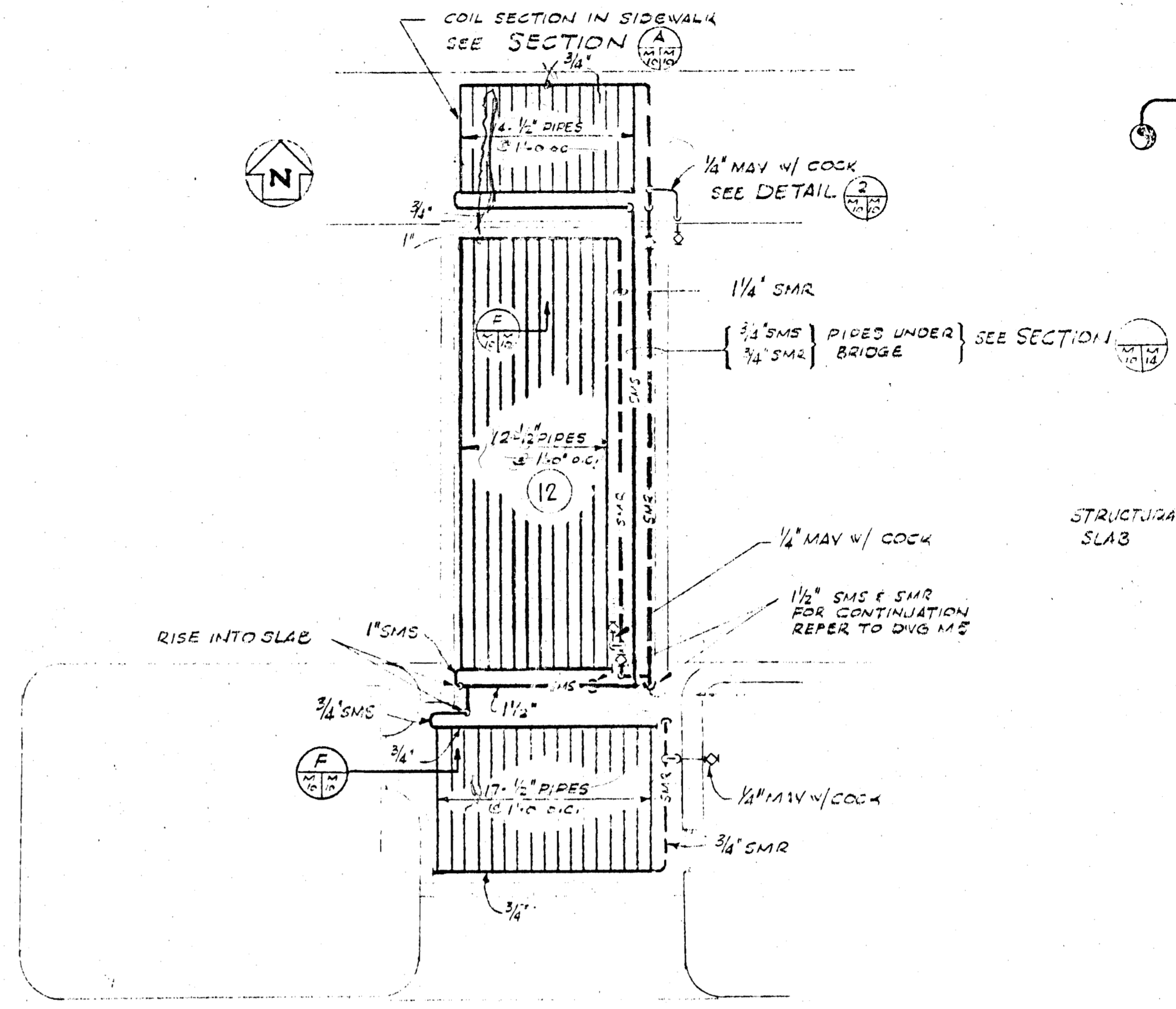


CHILLED WATER, COOLING TOWER & CONDENSER WATER PIPING FLOW DIAGRAM
 NOT TO SCALE

DR. Cross	CHKD. [Signature]	SUPD. [Signature]	SCALE 1/8" = 1'-0"
RELEASED	APPROVED	SHEET 55 OF 10	
[Signature]	LAB NUCLEAR STUDIES	DRAWING	
[Signature]	DATE NOV. 15, 1952	DATE JAN. 15, 1966	

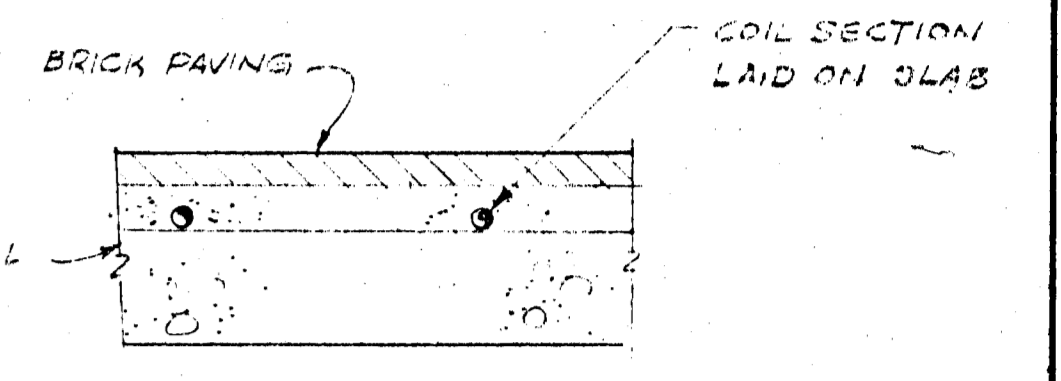


FOR CONTINUATION
REFER TO DWG. M.5
TRANSFORMER YARD PLAN
SCALE 1/8" = 1'-0"



BRIDGE PLAN
SCALE 1/8" = 1'-0"

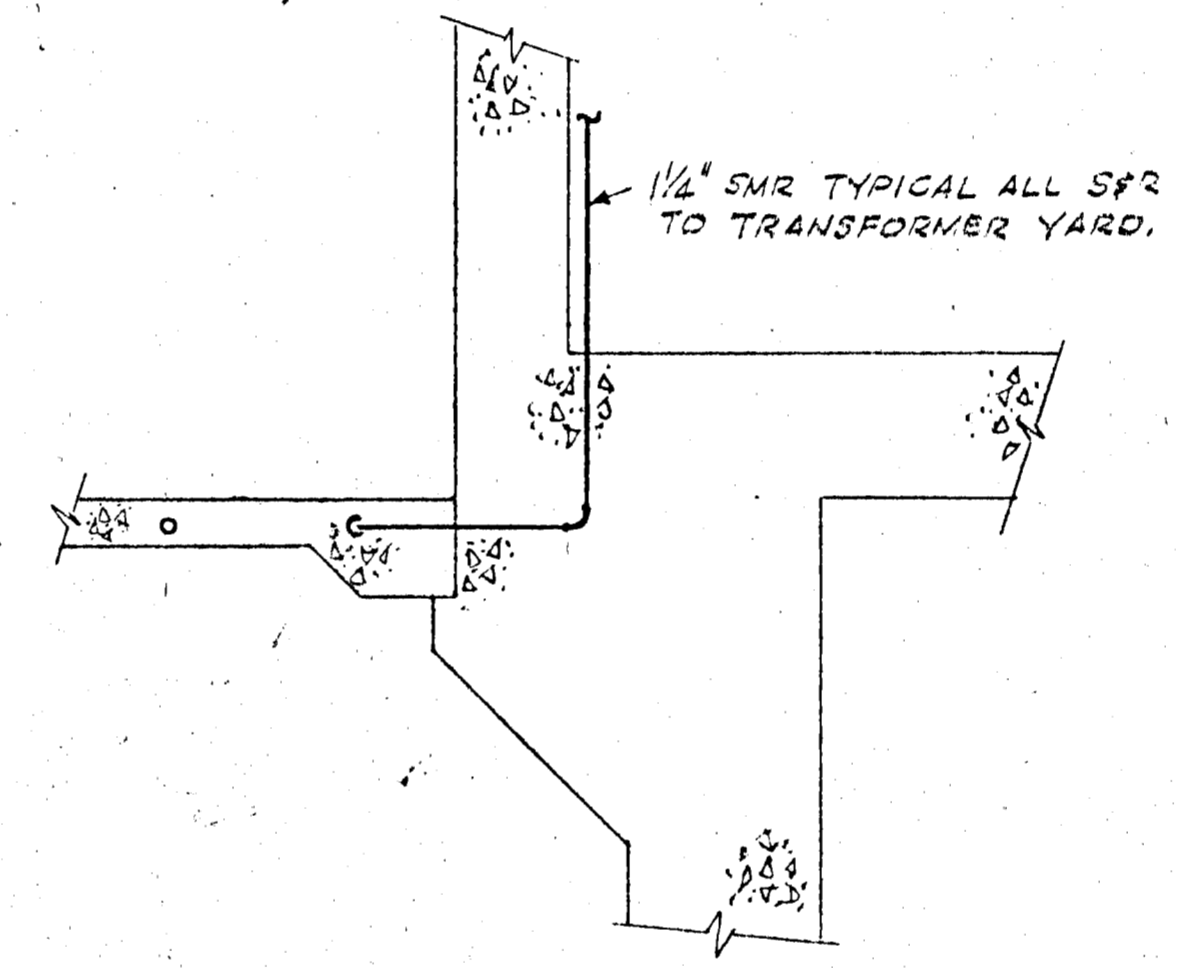
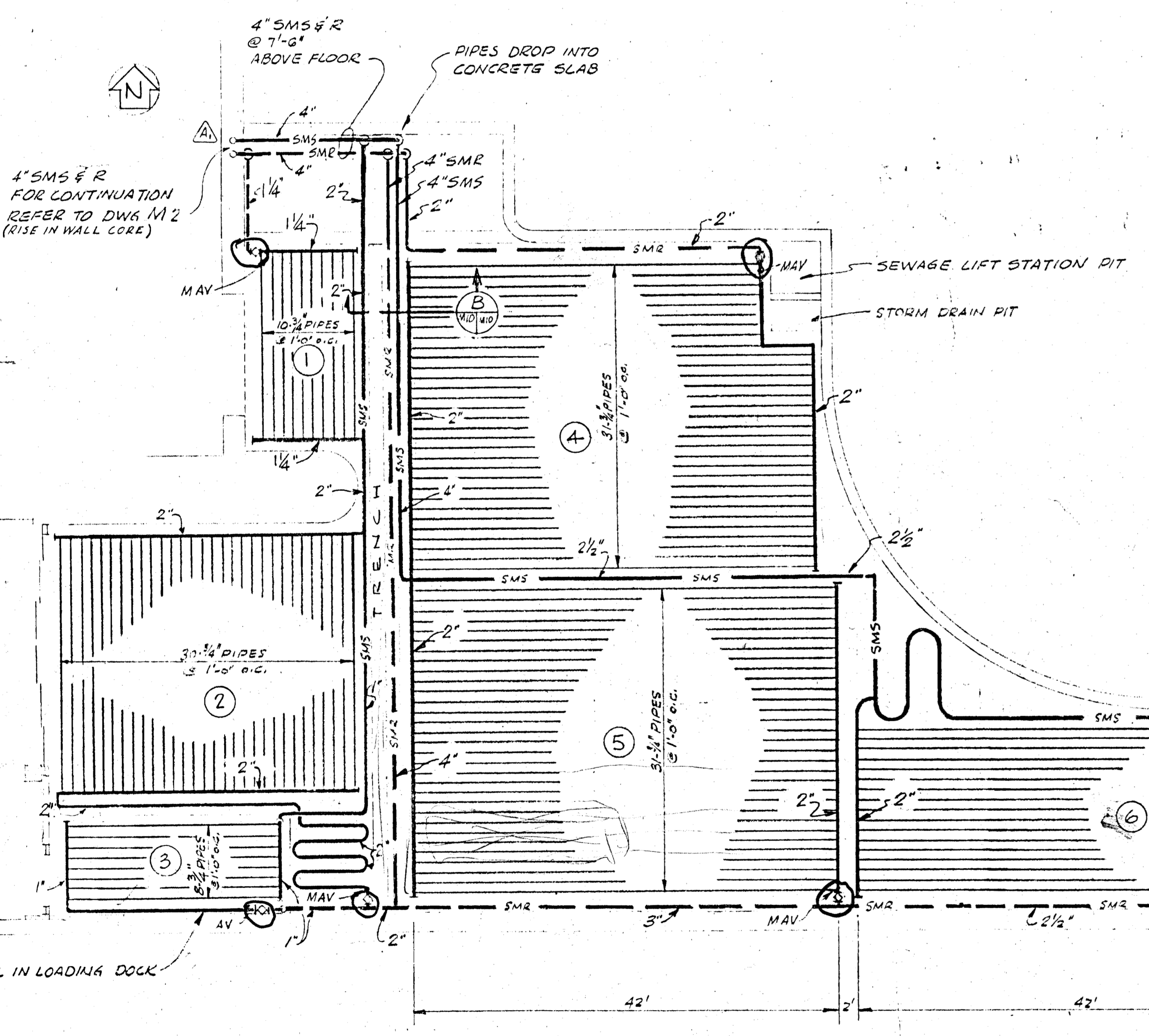
DETAIL 2
NO SCALE



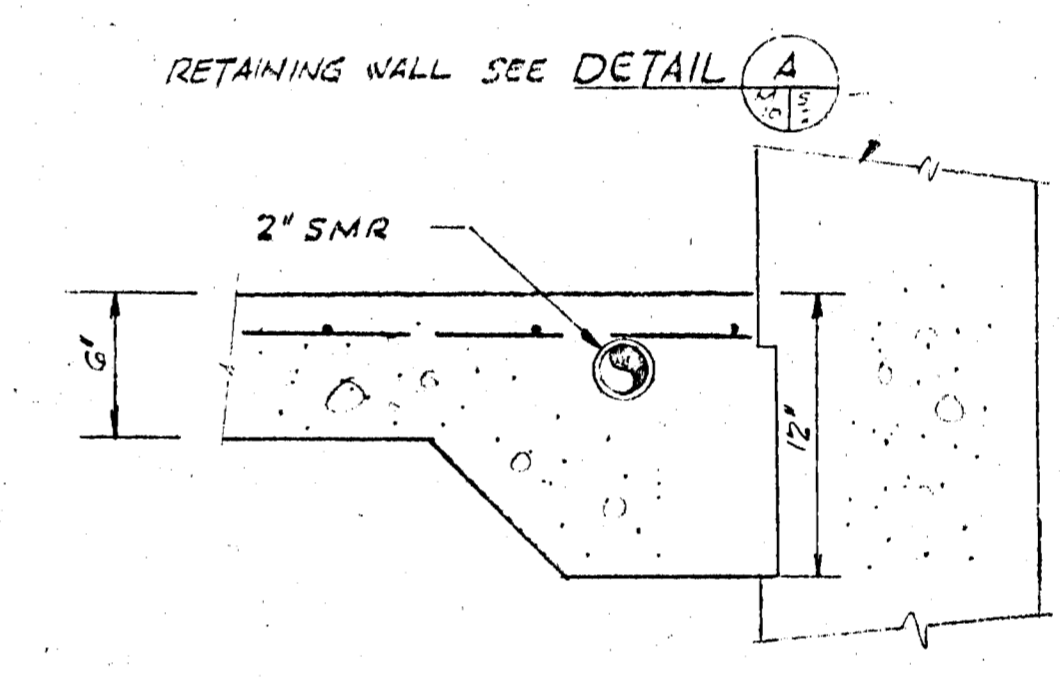
SECTION (F)
SCALE 1/2" = 1'-0"

- GENERAL NOTES**
1. ALL PIPING TO BE BURIED IN THE CONCRETE SLAB SHALL HAVE ALL JOINTS WELDED.
 2. HYDROSTATIC TEST ALL PIPING AT A PRESSURE OF 200 PSIG & PROVE TIGHT AT THIS PRESSURE FOR 4 HOURS BEFORE CONCRETE IS POURED.
 3. FLUSH & THOROUGHLY DRAIN ALL PIPING AFTER TEST.
 4. FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG. M.1.
 5. SLAB SHALL BE 12" THICK & ALL 2" & LARGER PIPES AS SHOWN IN SECTION (E) ON THIS SHEET.

ALL WORK SHOWN ON THIS DRAWING SHALL BE INCLUDED WITH BID ALTERNATE #15.

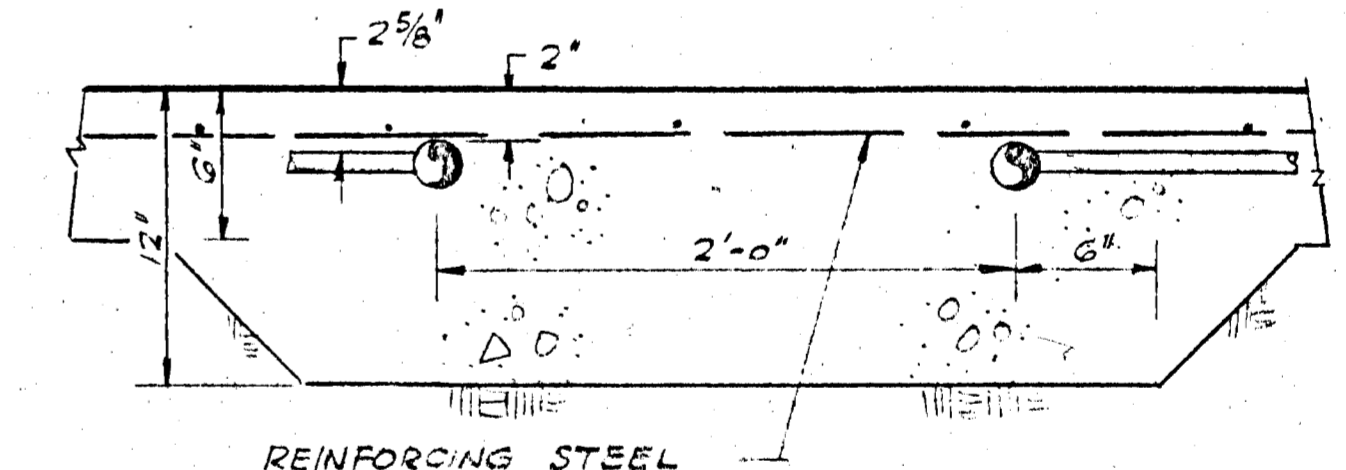


SECTION C
(TYPICAL FOR ALL S&R FEED LINES TO TRANSFORMER YARD COILS)



SECTION D
SCALE 1/2" = 1'-0"

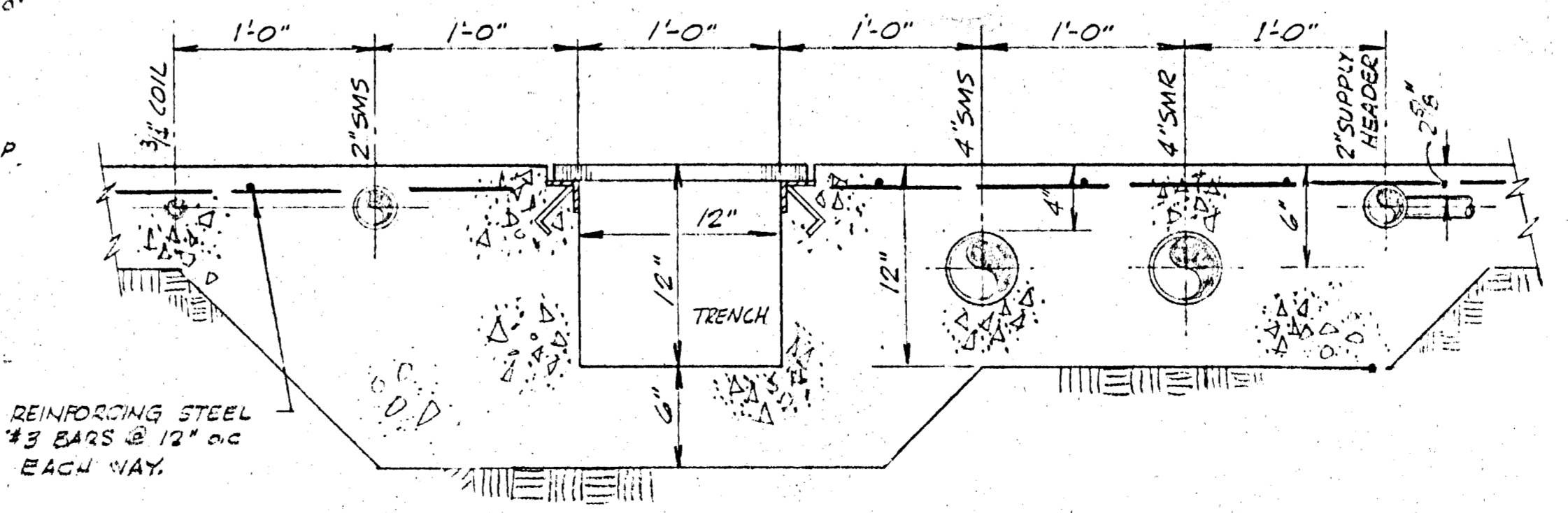
USE 12" SLAB WHEN PIPES ARE 2" & LARGER



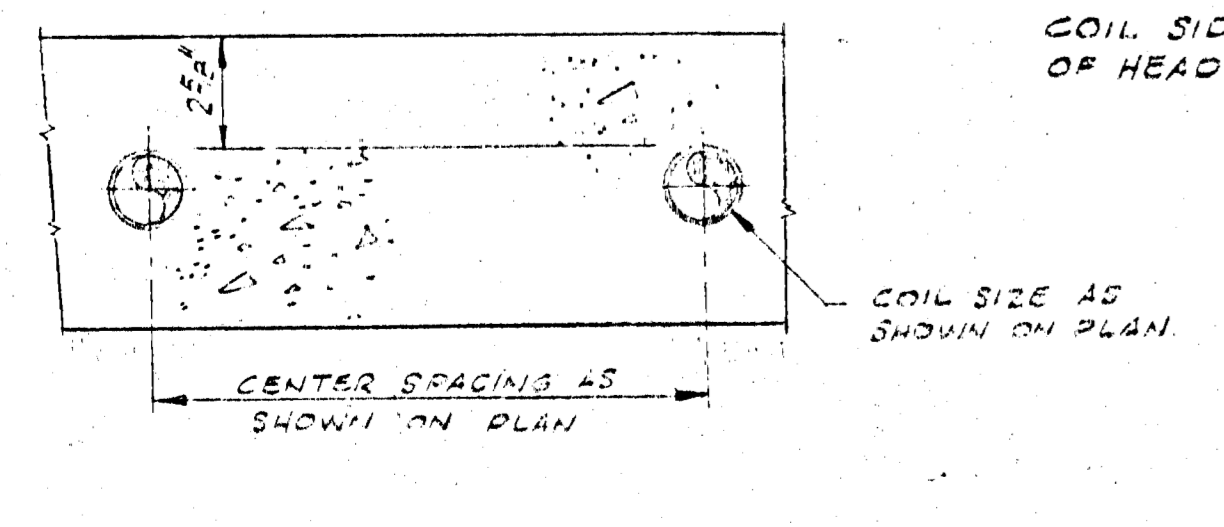
SECTION E
SCALE 1/2" = 1'-0"

SEE DETAIL (G)

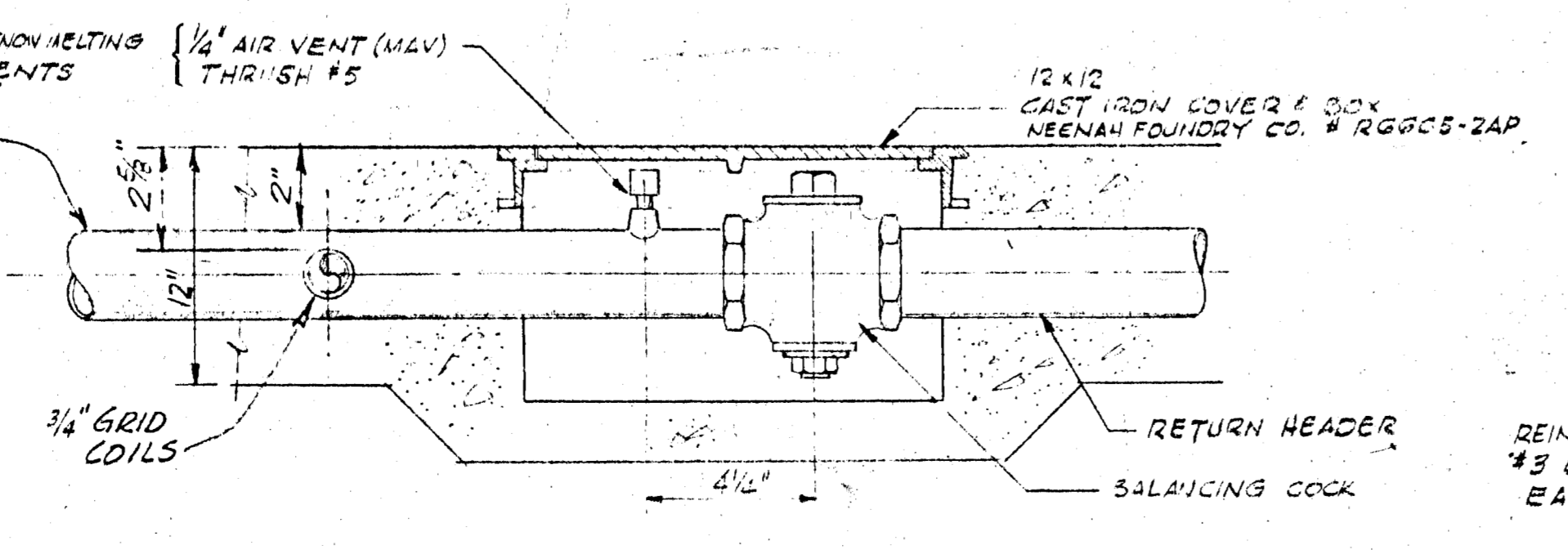
STAGING AREA & RAMP PLAN
SCALE 1/8" = 1'-0"



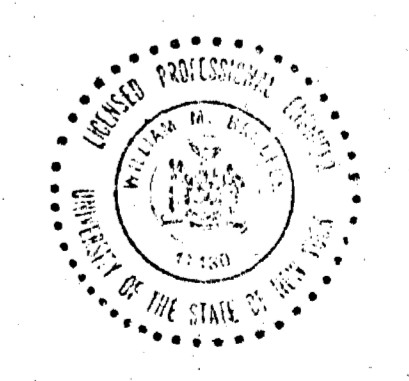
SECTION (B)
SCALE 1/2" = 1'-0"



TYPICAL COIL PIPING SECTION (A)
NO SCALE



DETAIL (A)
SCALE 3" = 1'-0"
TYPICAL FOR ALL BALANCING COCKS



LTR	REVISIONS	DATE	CHKD BY	APPD

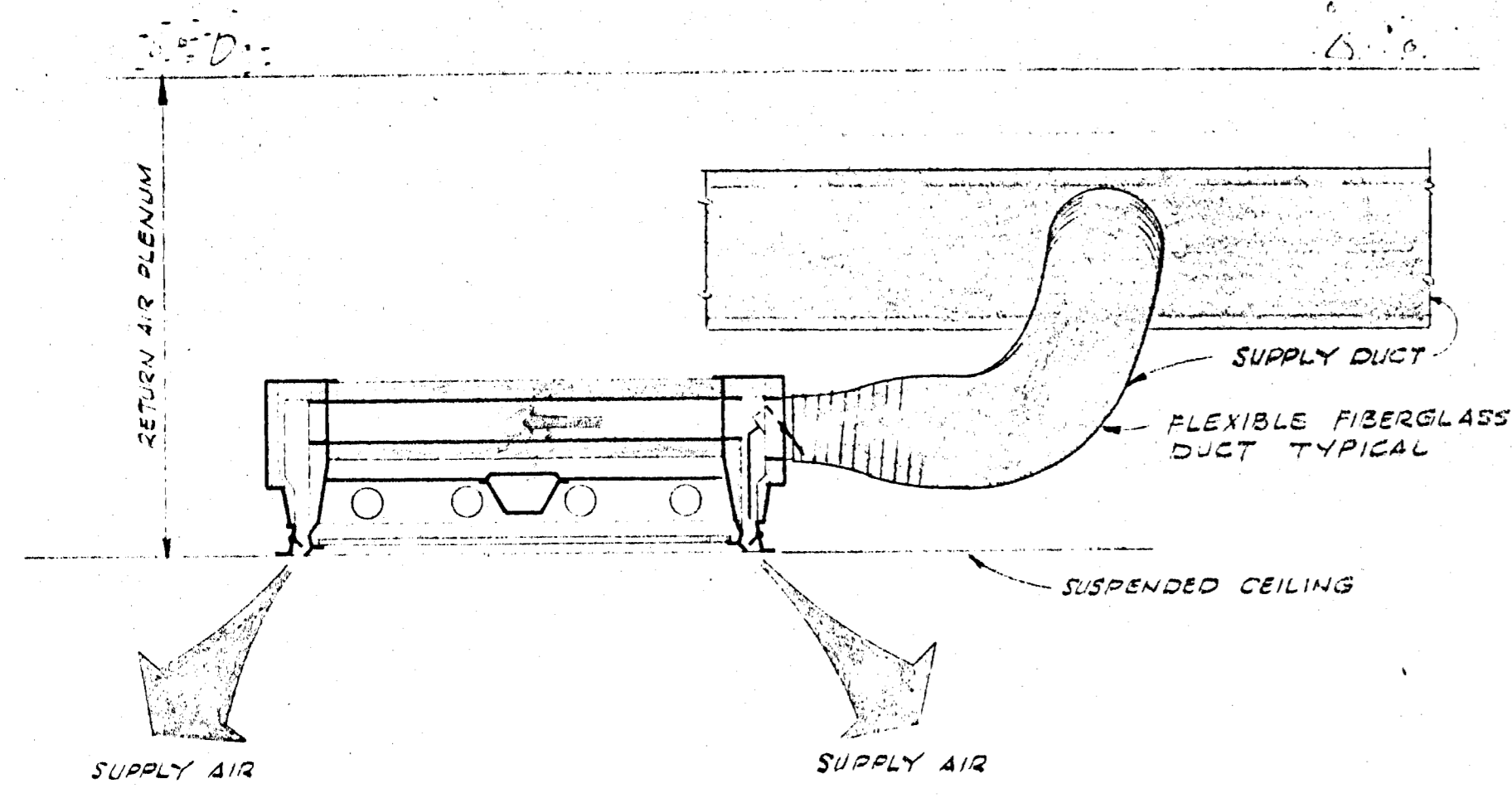
**IO GEV CORNELL
SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA NEW YORK**

**SNOW MELTING
COIL PLANS
& DETAILS**

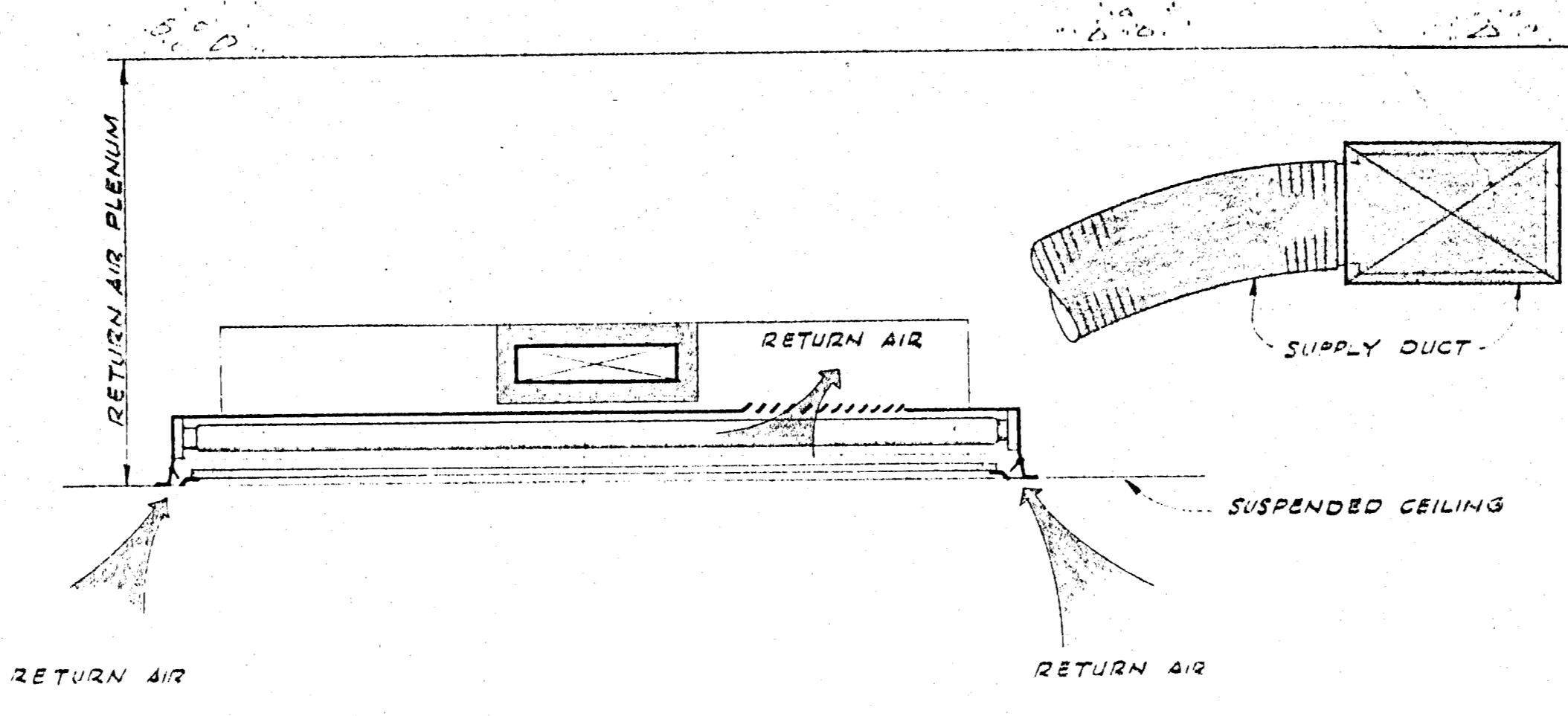
WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
PREGONOFF & MATHEU STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-524-8868

DR. DESIGNED	CHKD BY	SUPV. BY	SCALE
			NOTED
RELEASED	APPROVED		SHEET OF
			58 102
			DRAWING NO.

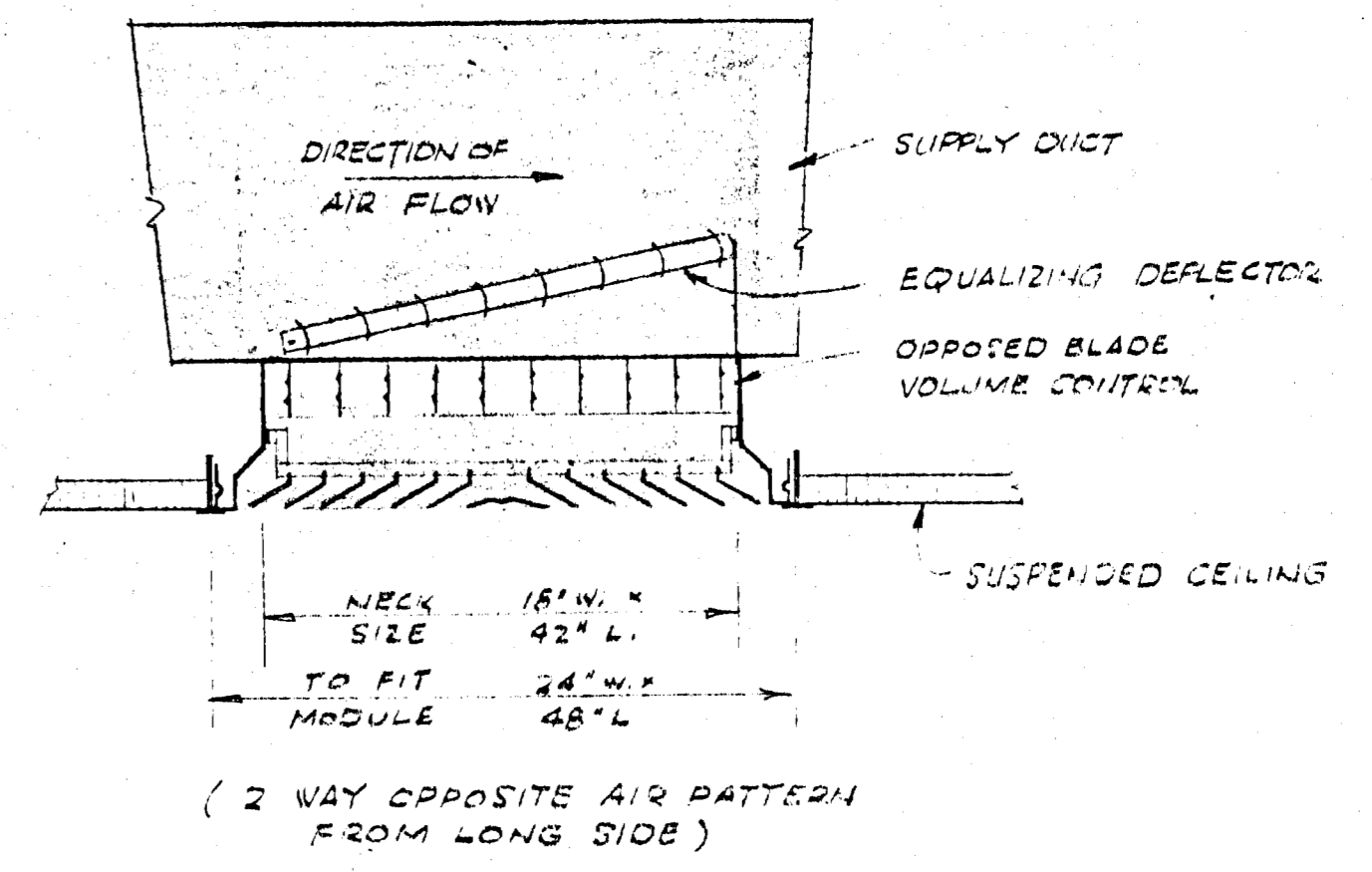
APPROVED FOR



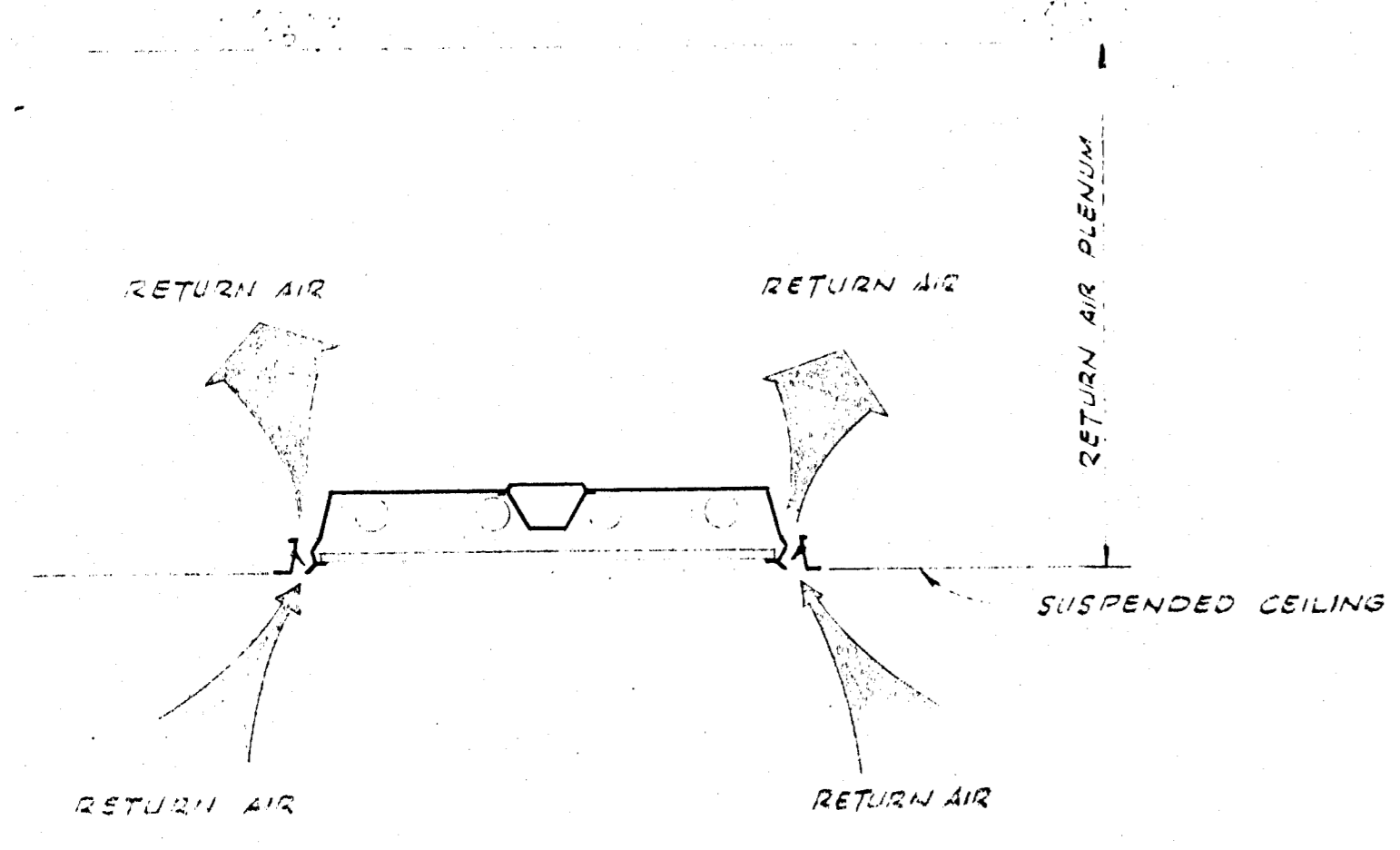
TYPICAL TRANSVERSE SECTION THRU
TYPE I LIGHT FIXTURE
SCALE 1/2" = 1'-0"



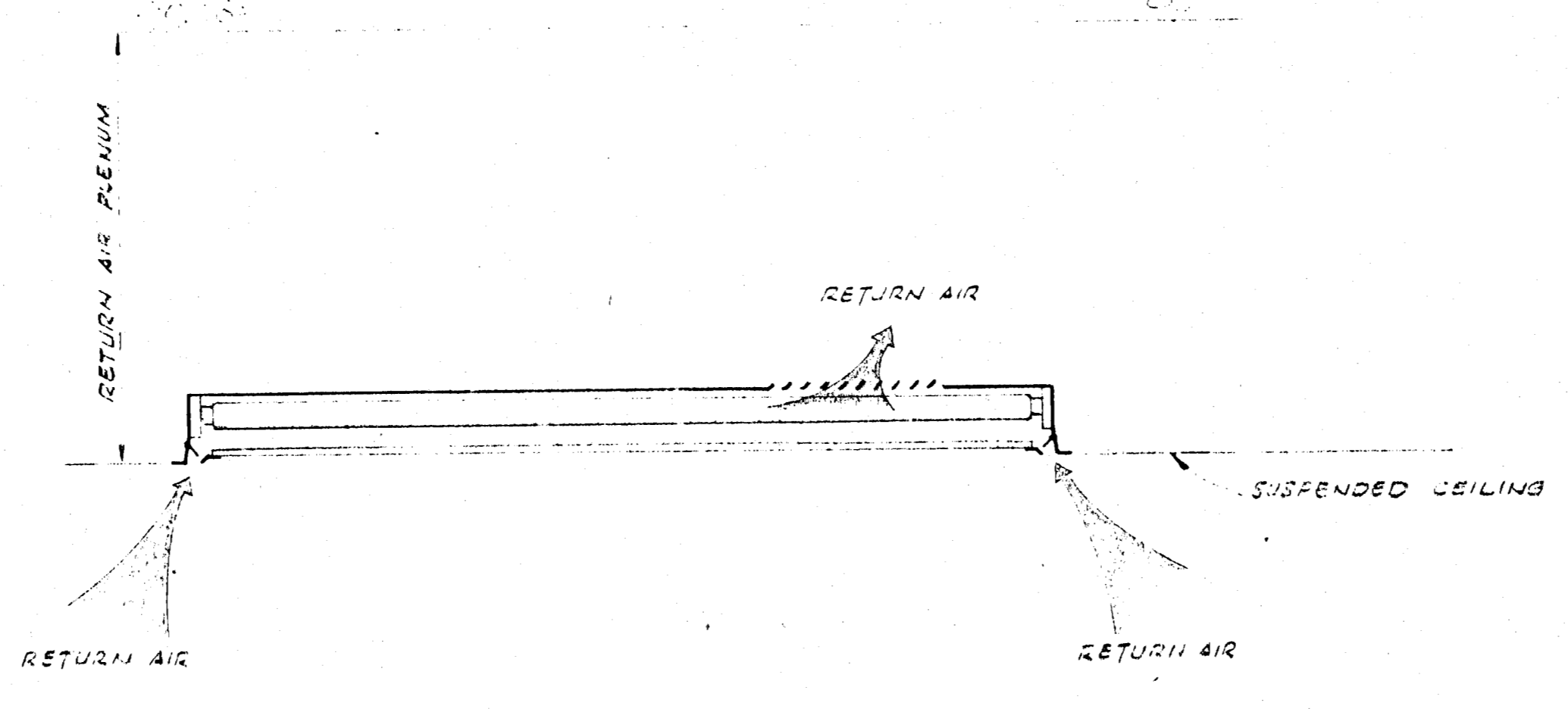
TYPICAL LONGITUDINAL SECTION THRU
TYPE I LIGHT FIXTURE
SCALE 1/2" = 1'-0"



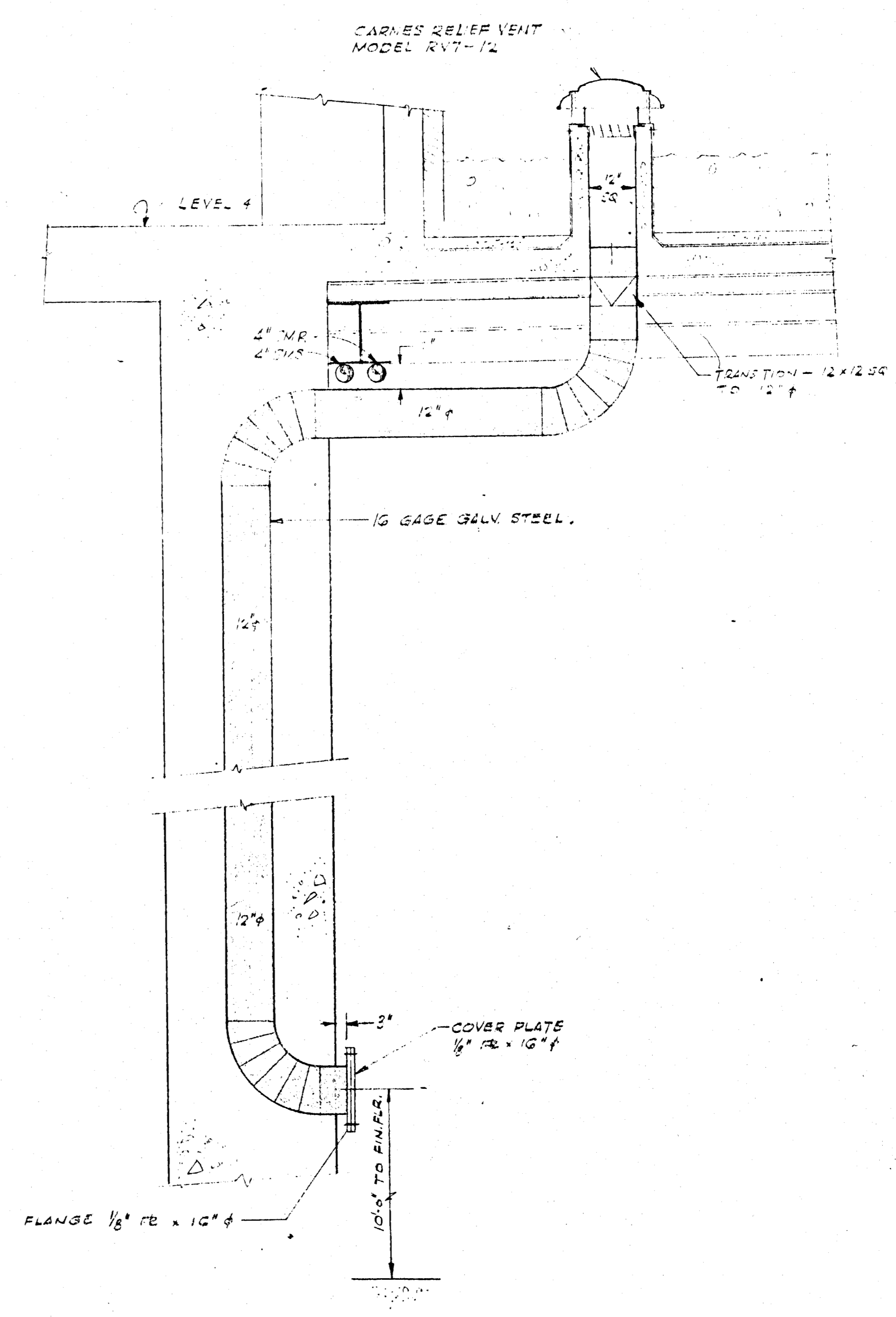
TYPICAL DETAIL 4
THRU 48" X 24" DIFFUSER
NO SCALE



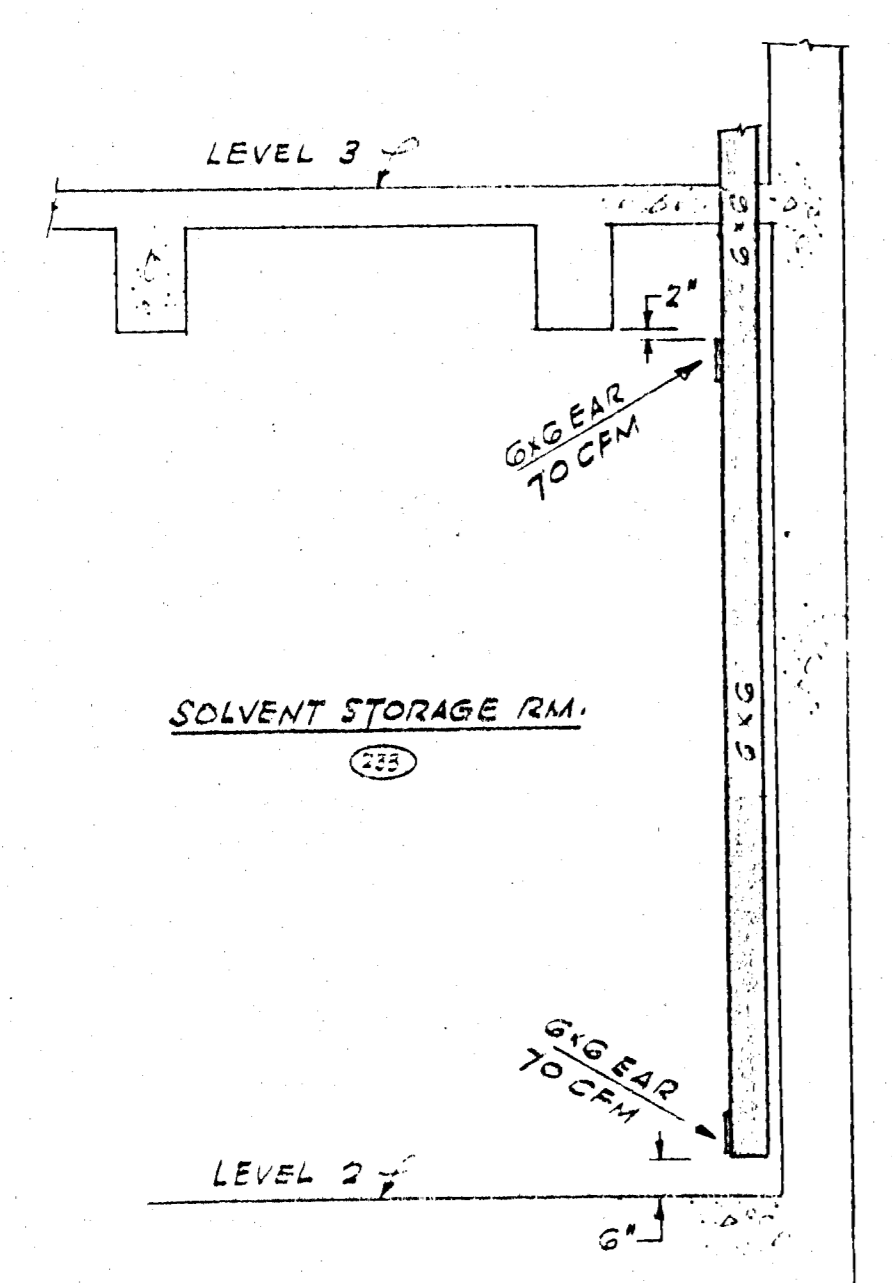
TYPICAL TRANSVERSE SECTION THRU
TYPE II LIGHT FIXTURES
SCALE 1/2" = 1'-0"



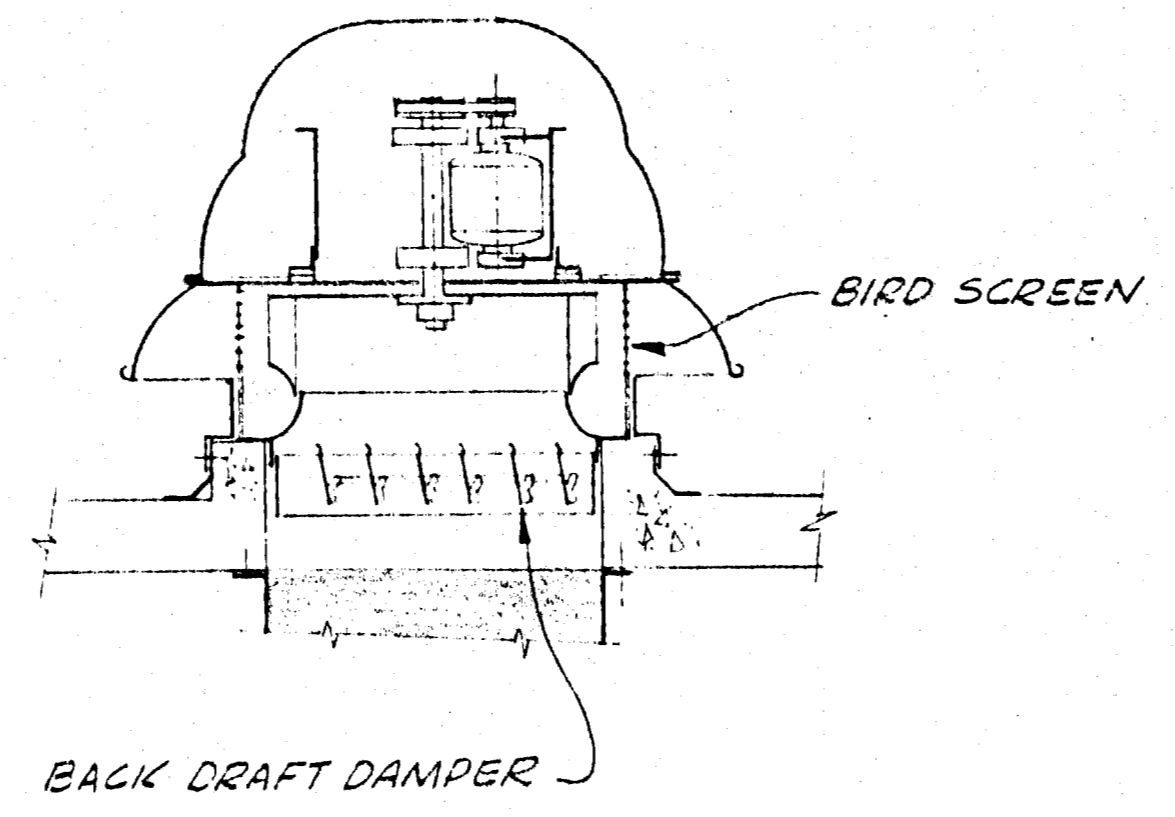
TYPICAL LONGITUDINAL SECTION THRU
TYPE II LIGHT FIXTURE
SCALE 1/2" = 1'-0"



TYPICAL SYNCHROTRON HALL VENT DETAIL
SCALE 1/2" = 1'-0"



SOLVENT STORAGE RM. EAR DETAIL
SCALE 3/8" = 1'-0"



TYPICAL ROOF FAN DETAIL
SCALE 3/4" = 1'-0"

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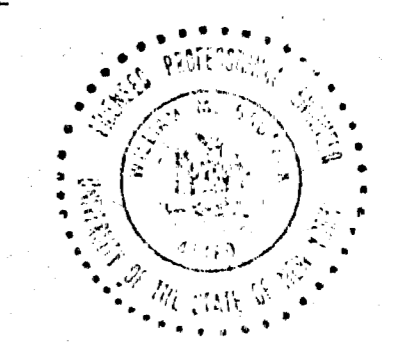
AIR CONDITIONING
HEATING & VENTILATING
DETAILS

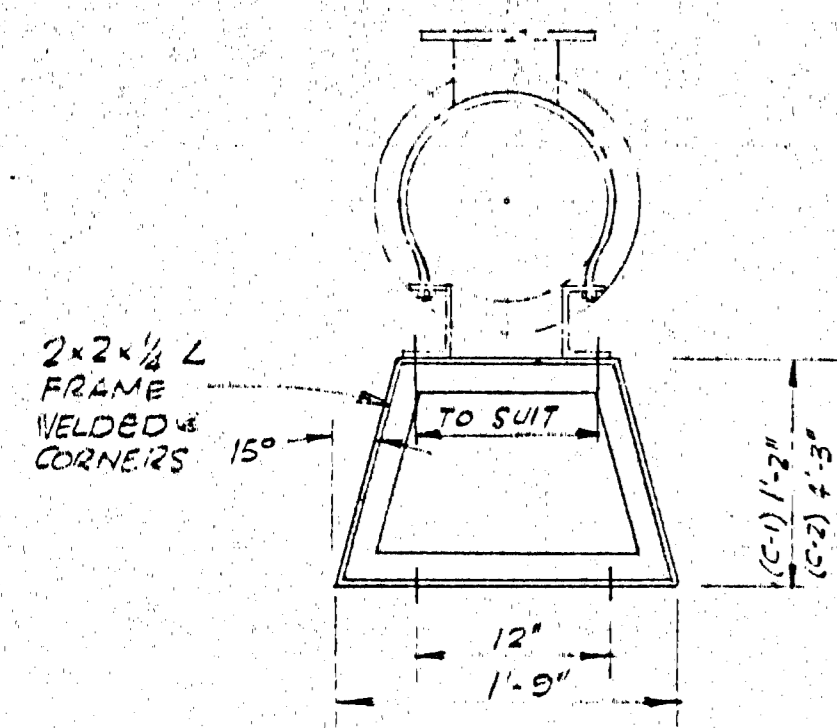
WILLIAM M. BROBECK AND ASSOCIATES
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PREGONOFF & MATHEU STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415 - 524 - 8864

DR.	REVISION	CHKD	BY	SUPV	DATE	SCALE

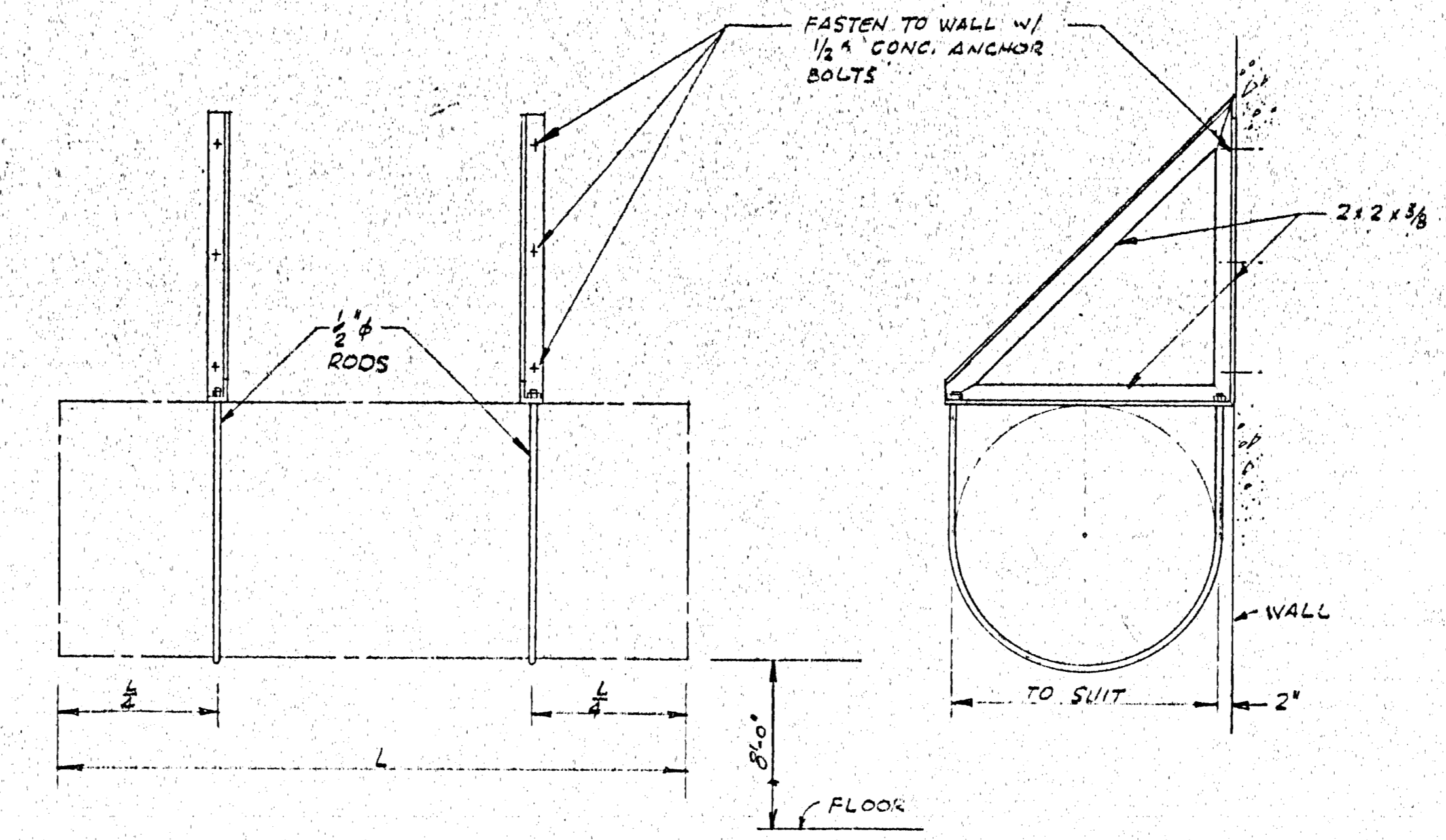
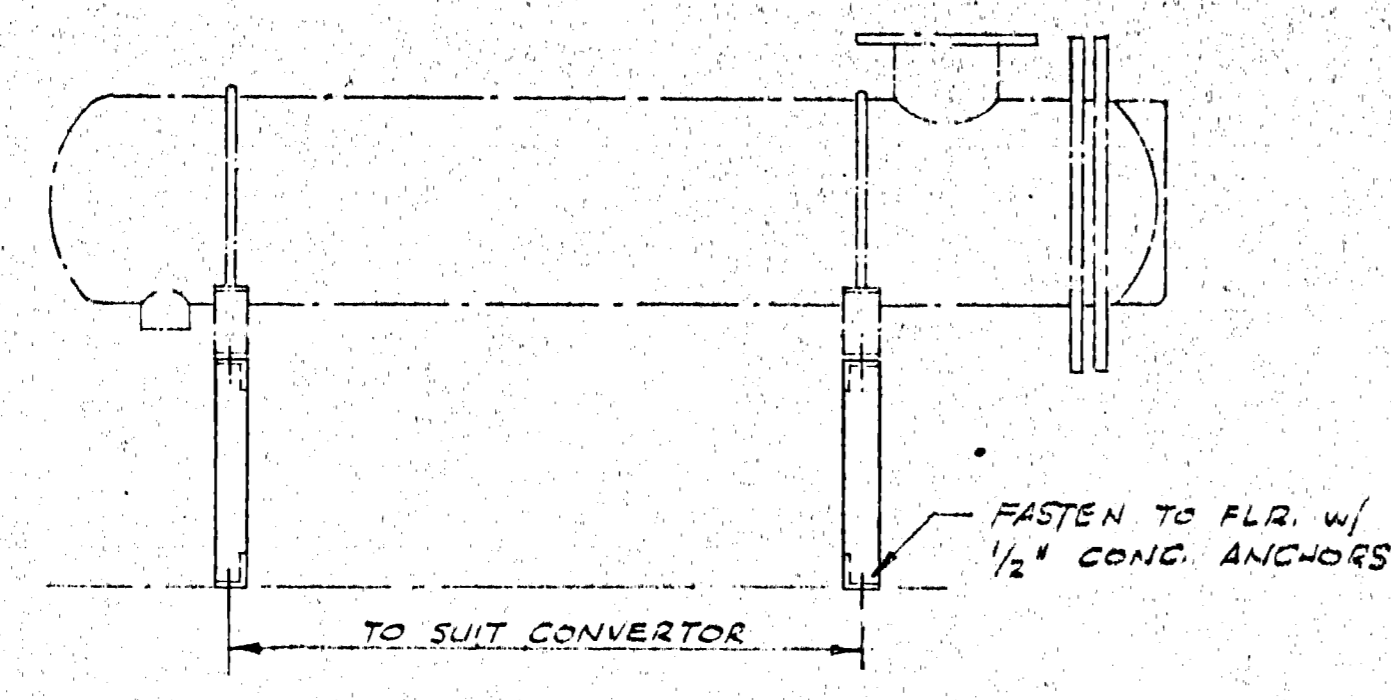
RELEASED	APPROVED	SHEET	OF
T.H. [Signature]	LAB NUCLEAR STUDIES	57	102
W.M.B. [Signature]	V.P. BUSINESS	DRAWING NO.	
DATE NOV. 15, 1966	DATE JAN. 15, 1966	WMB & A NO. 111-3	

NOTE
1. FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO Dwg. M.1.

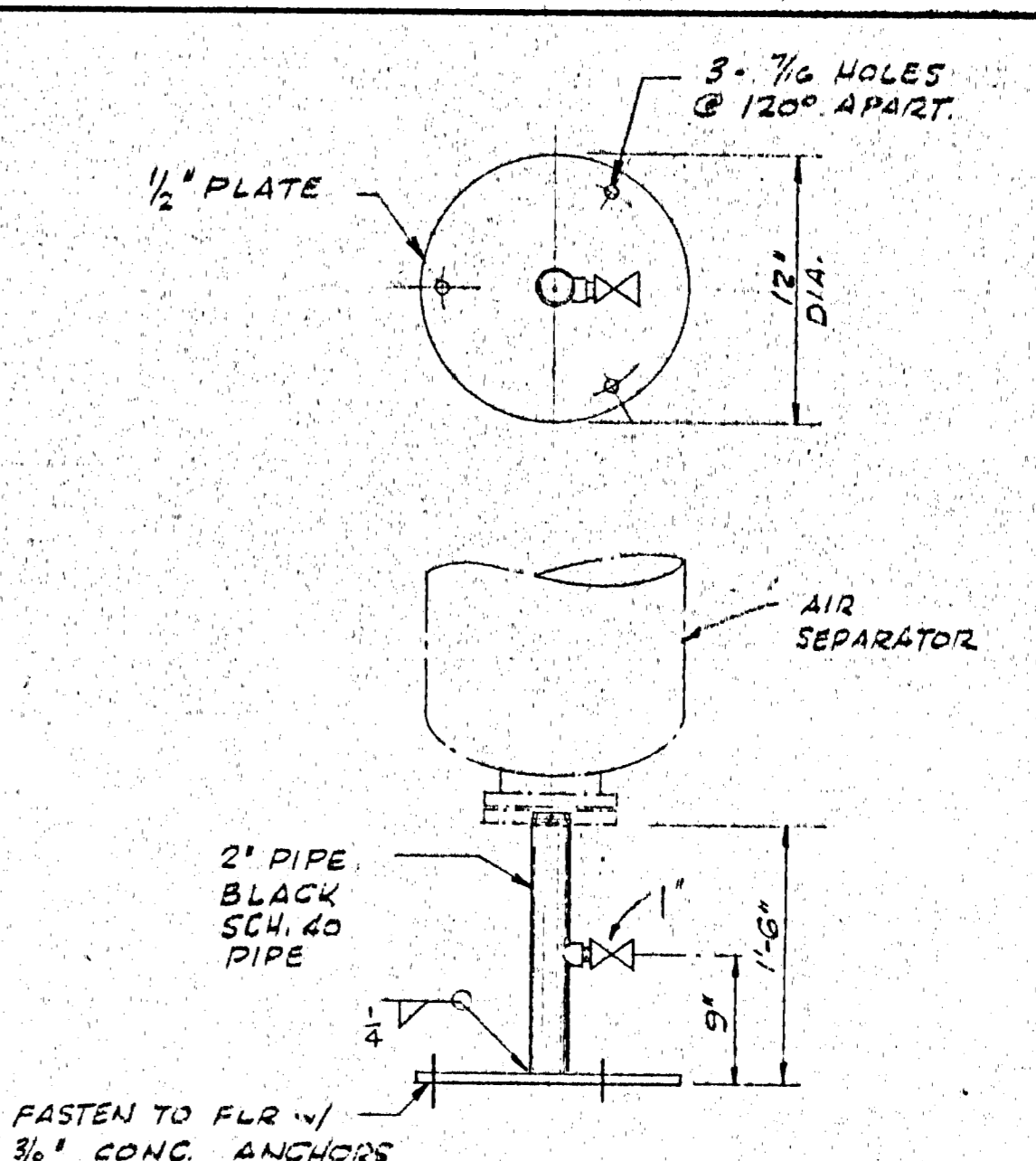




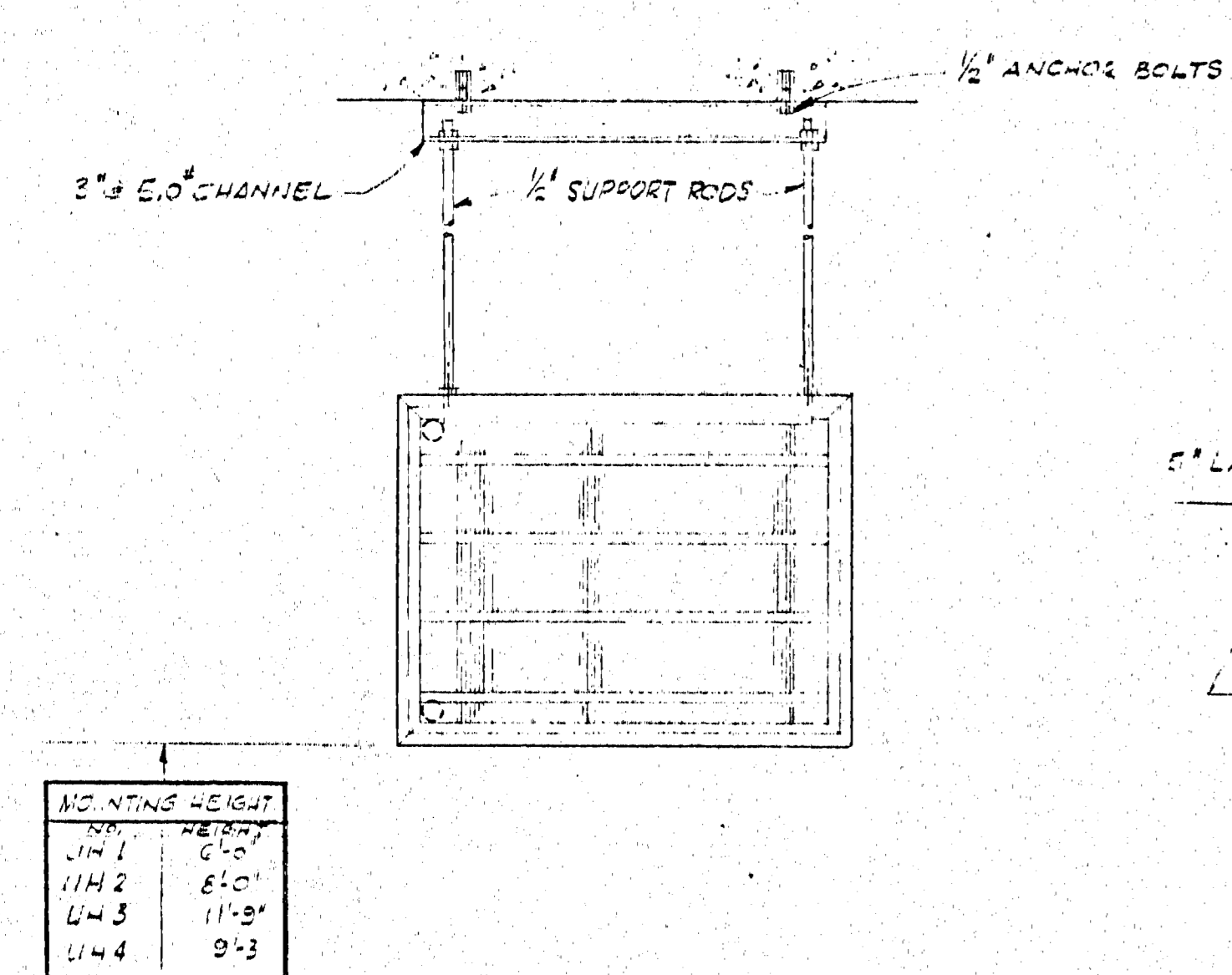
CONVERTOR SUPPORT DETAIL (1)
SCALE 1" = 1'-0"



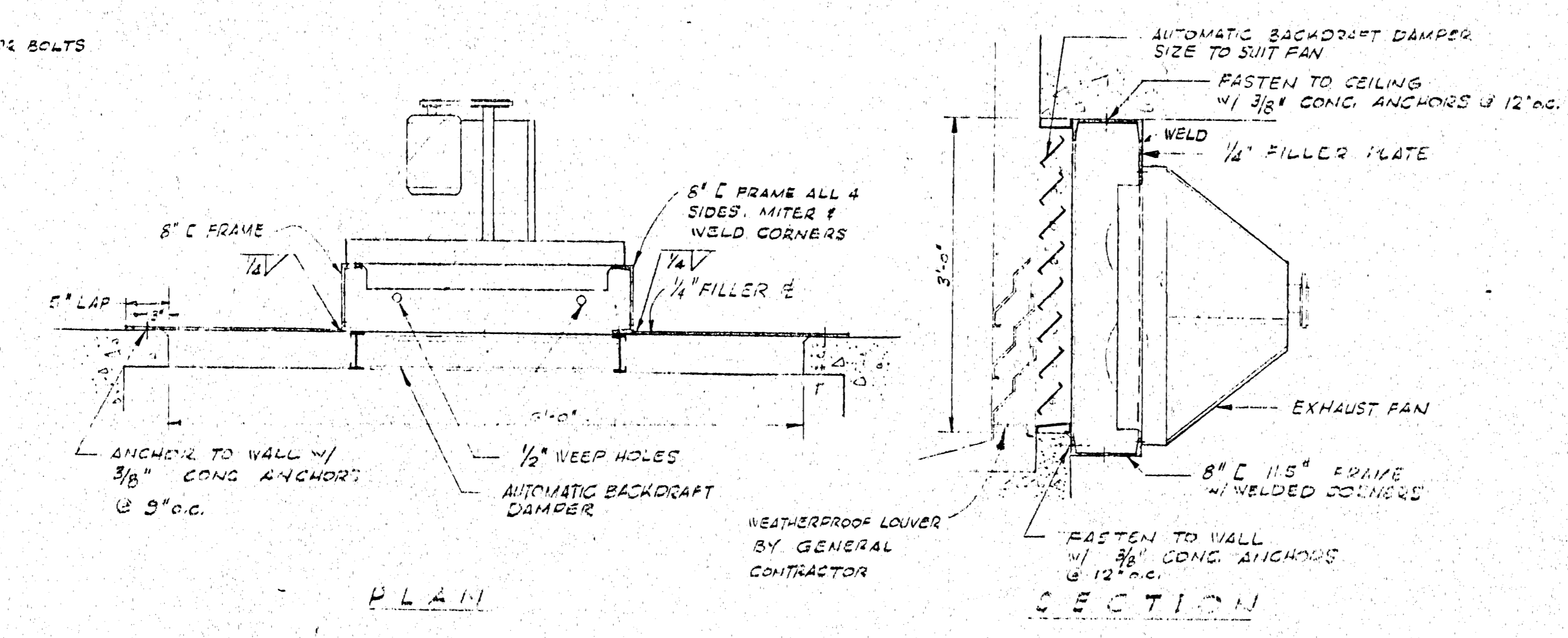
COMPRESSION TANK SUPPORT DETAIL (2)
NO SCALE



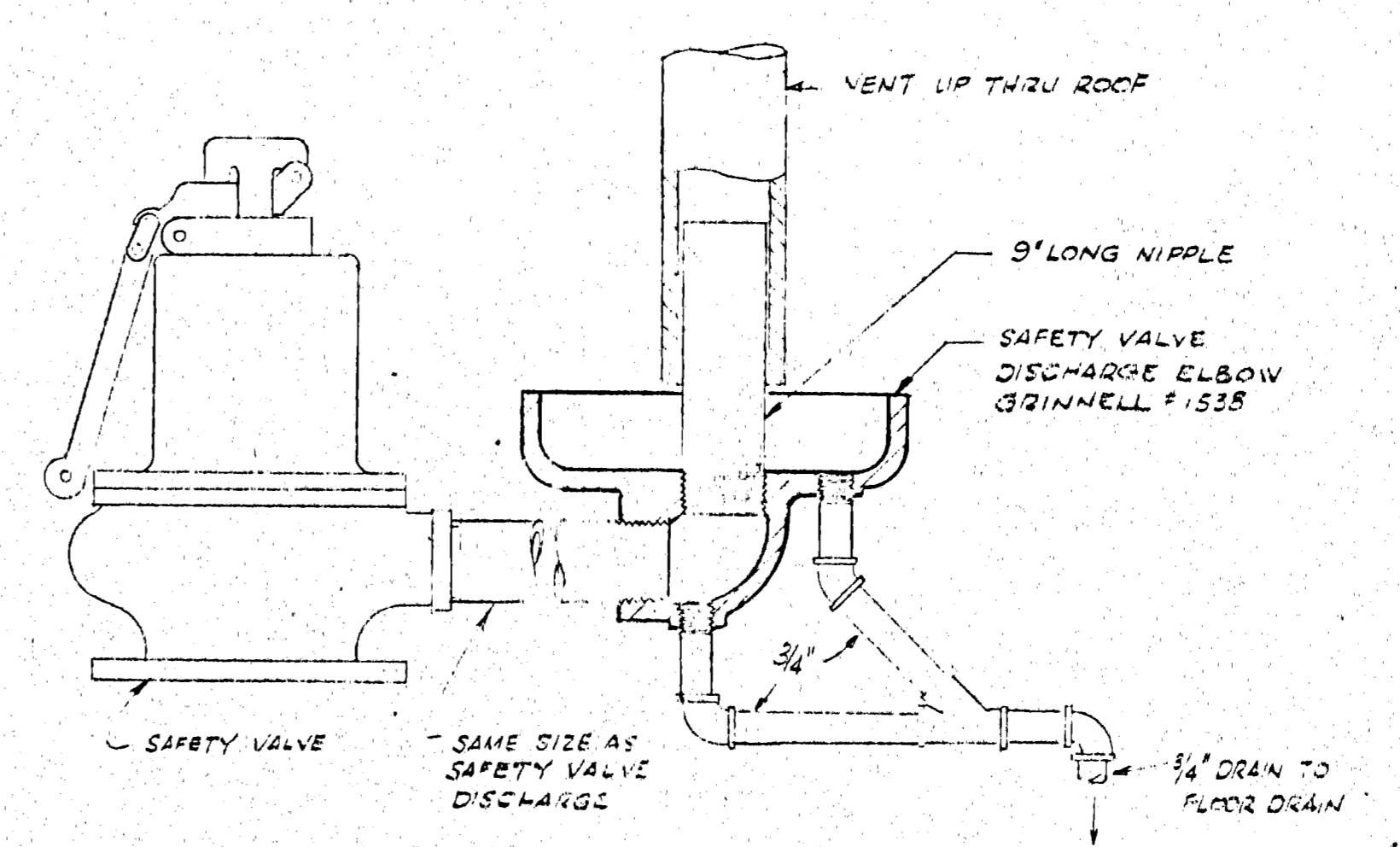
AIR SEPARATOR SUPPORT DETAIL (3)
NO SCALE



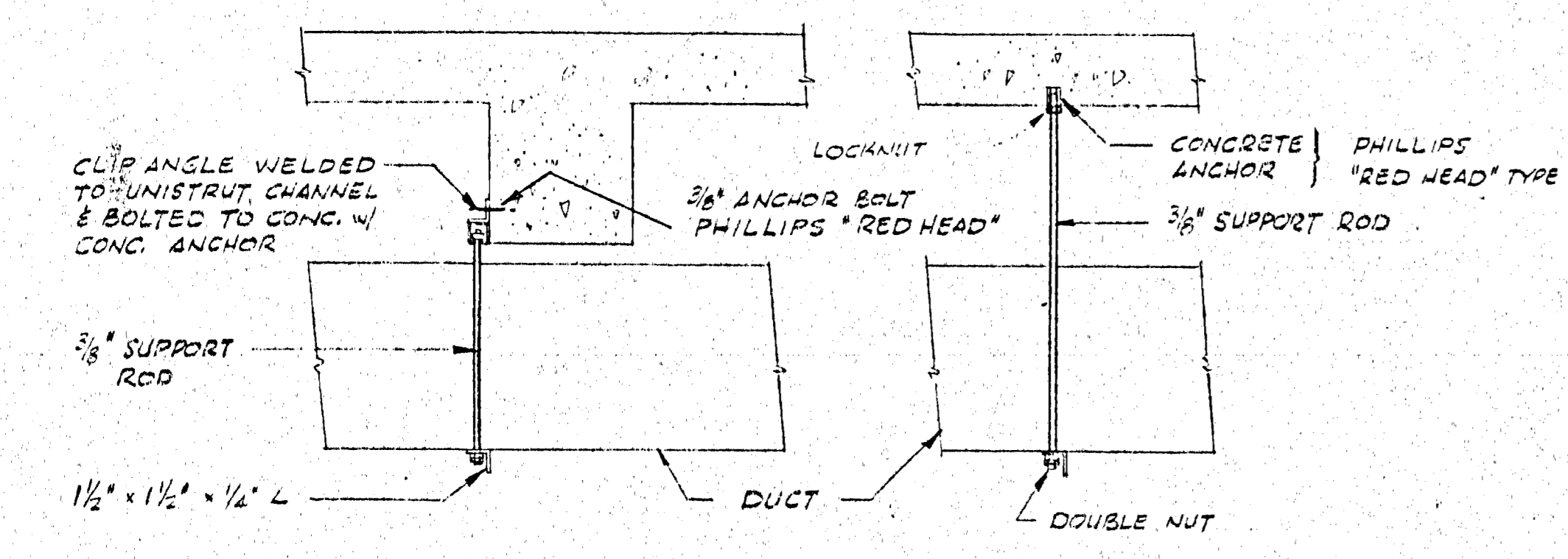
UNIT HEATER SUPPORT DETAIL (4)
NO SCALE



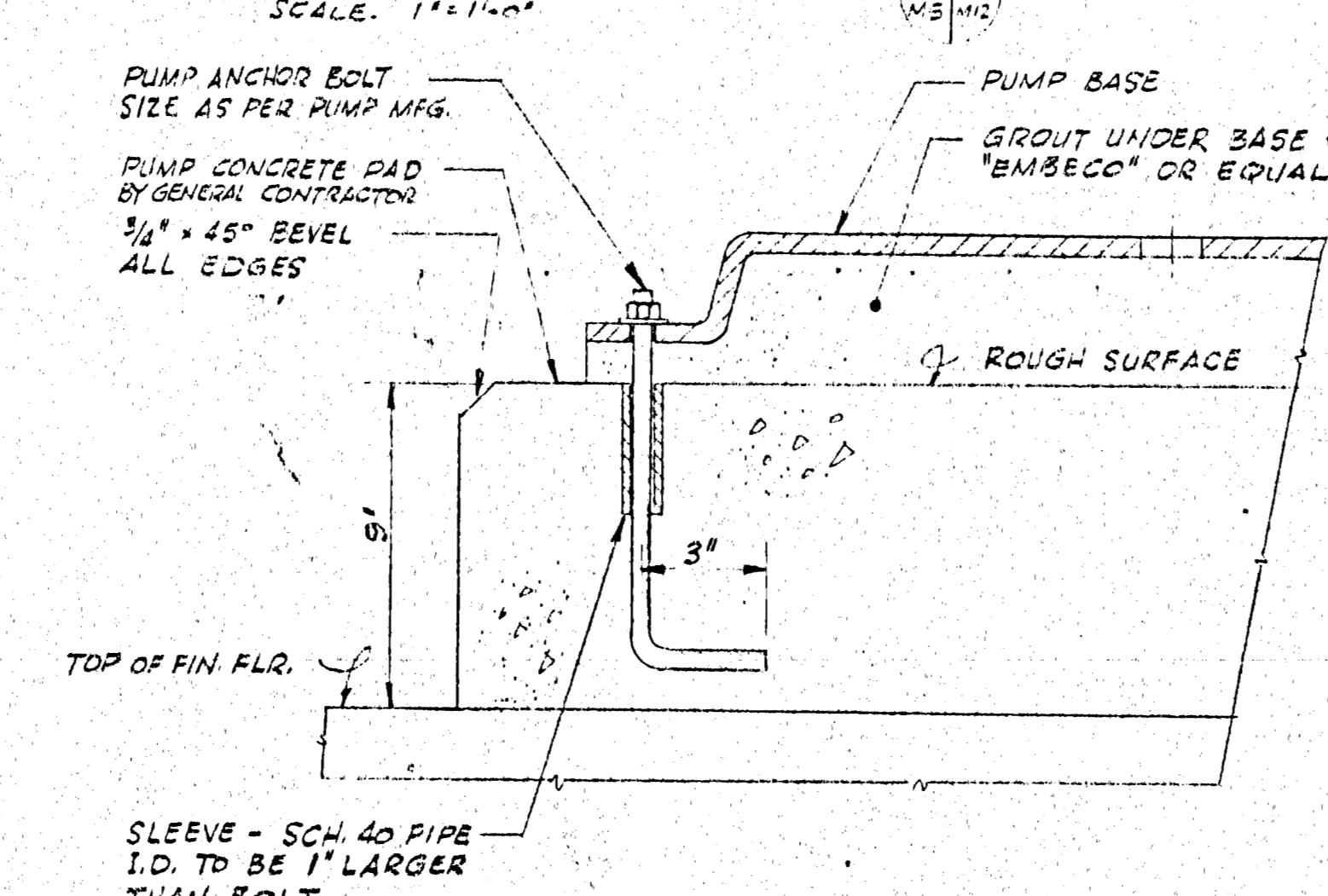
EXHAUST FAN SUPPORT DETAIL (5)
SCALE 1/4\"/>



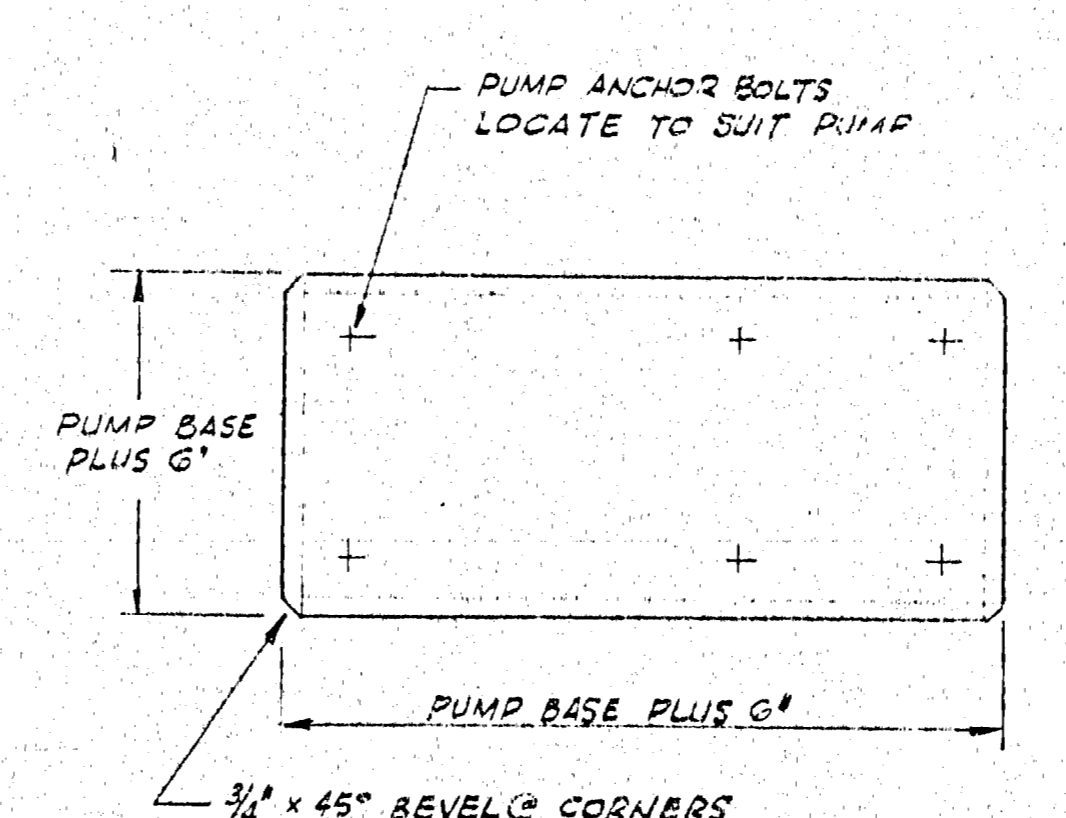
SAFETY VALVE DISCHARGE ELBOW DETAIL (6)
NO SCALE



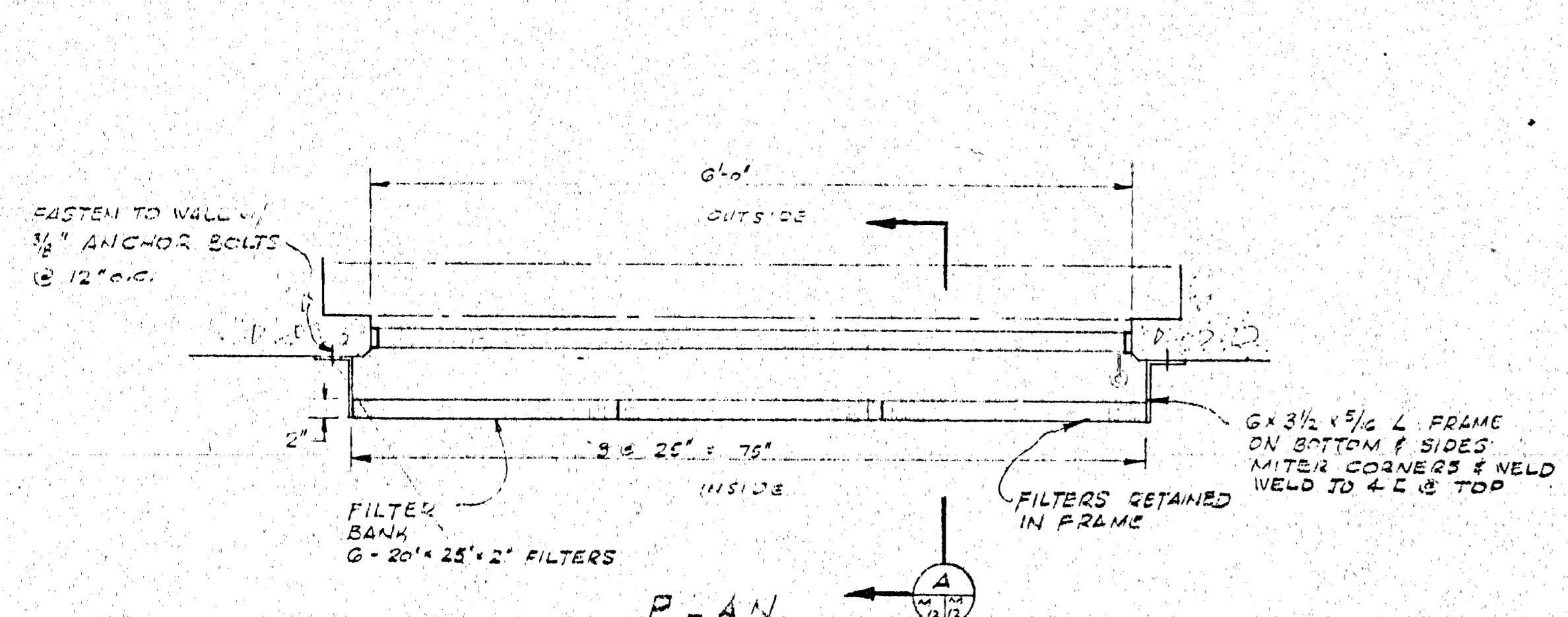
TYPICAL DUCT SUPPORT DETAIL (7)
FOR ALL EXPOSED DUCTS



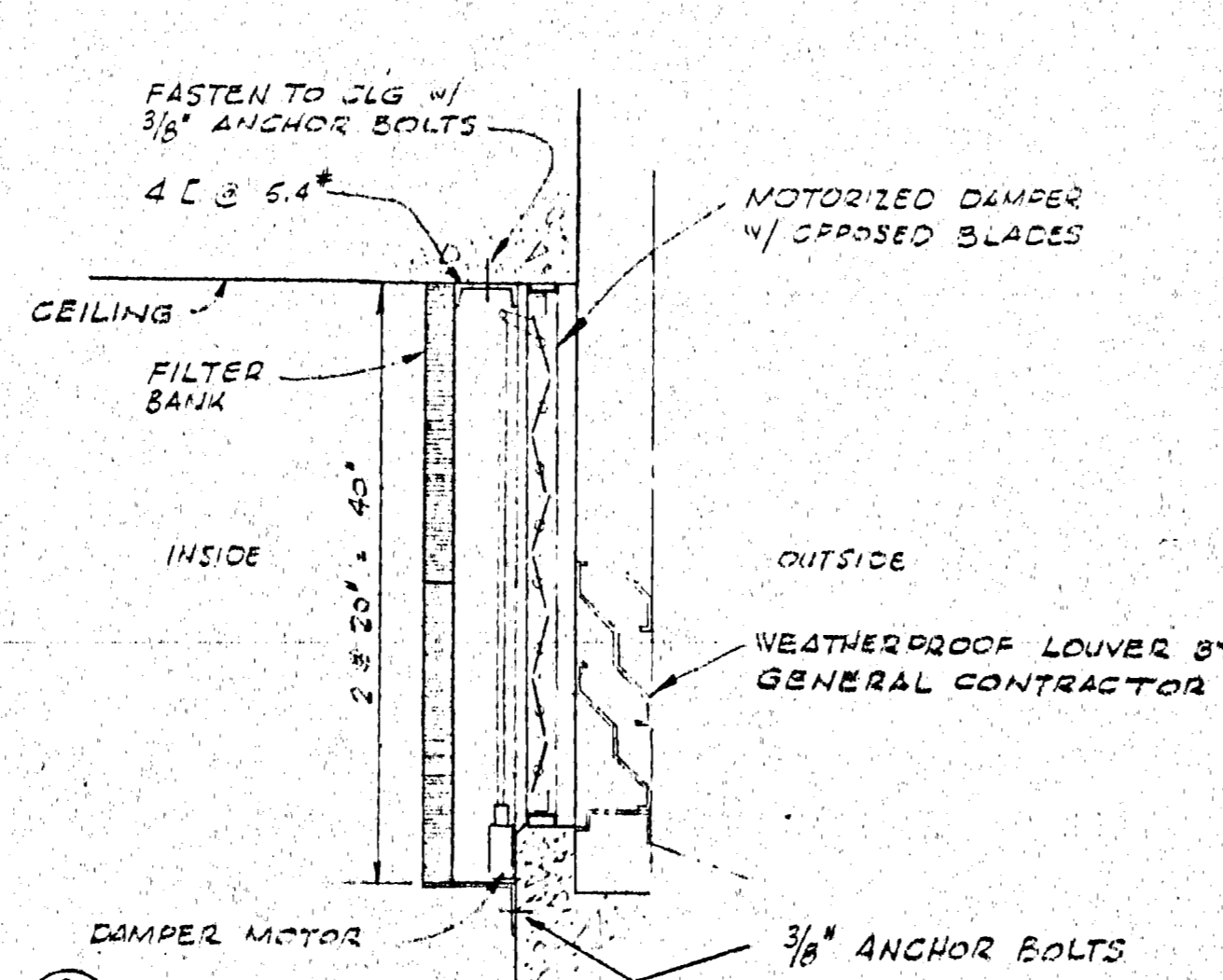
PUMP BASE DETAIL (8)
NO SCALE



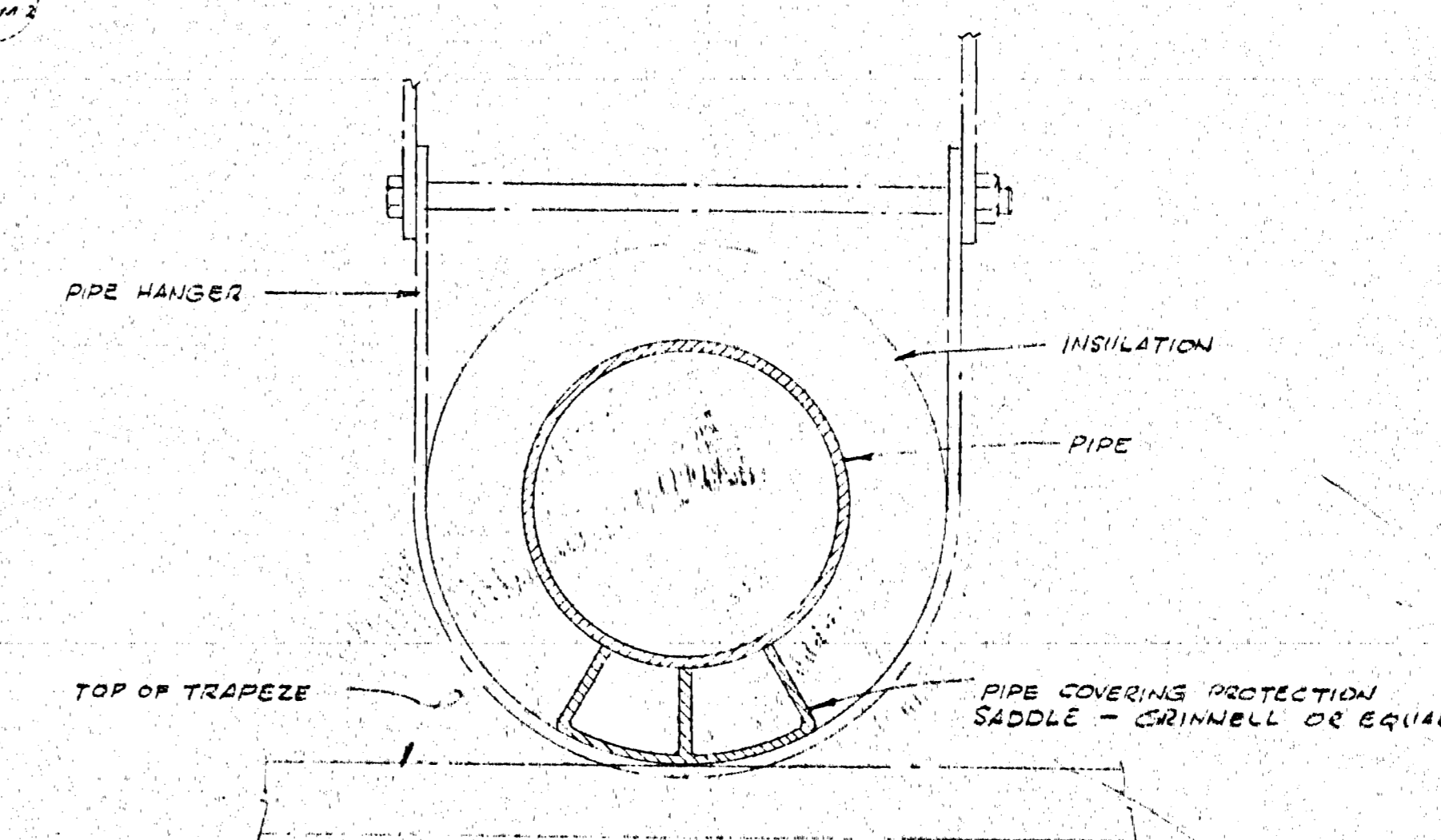
NOTE
1. FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG. M-1



INTAKE DAMPER & FILTER SUPPORT DETAIL (9)
NO SCALE



SECTION (A)



INSULATED PIPE SUPPORT DETAIL (10)
NO SCALE

APPROVED FOR CONSTRUCTION

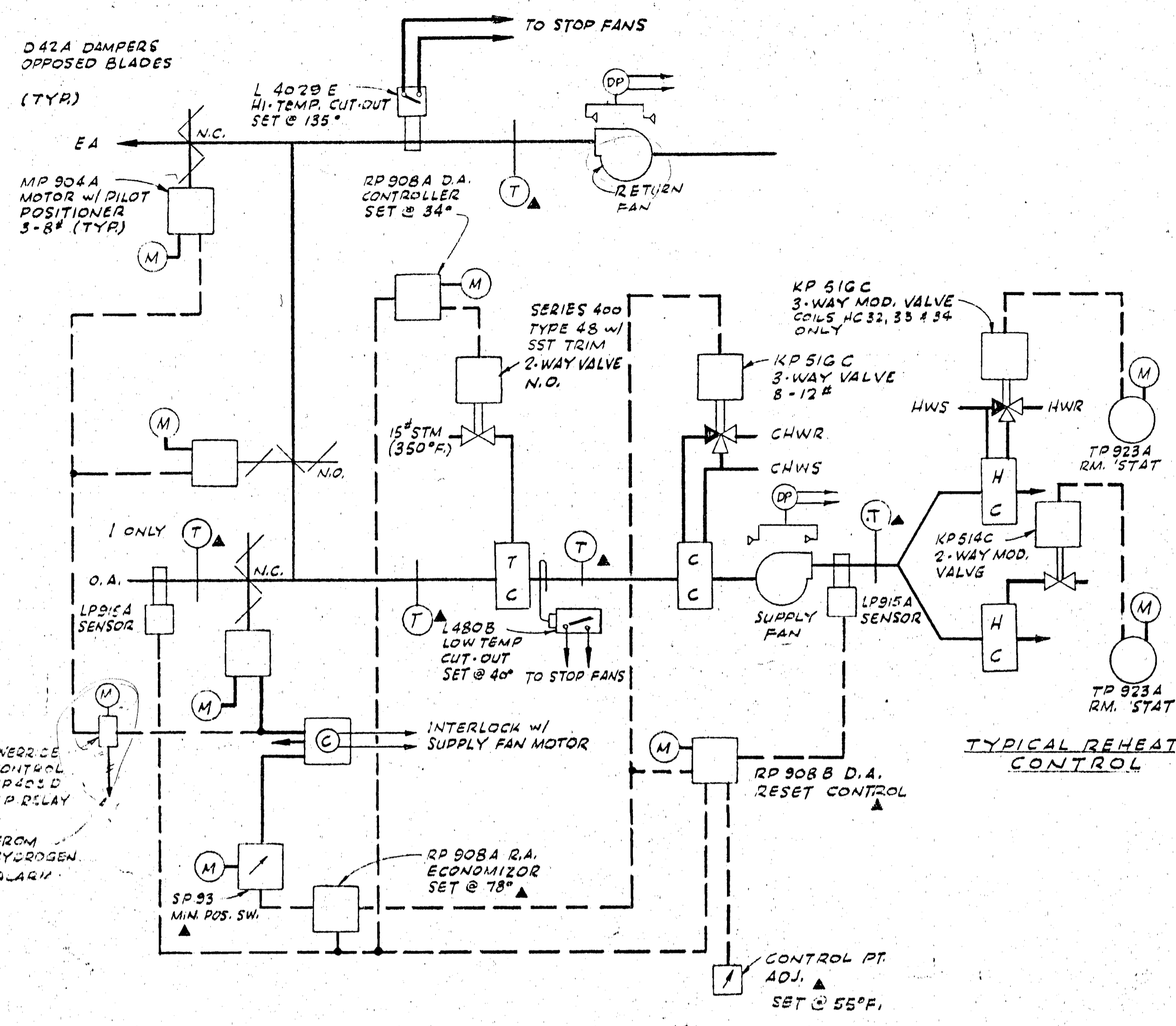
REVISIONS		DATE	CHKD	APPD
NO.	DESCRIPTION			

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ITHACA, NEW YORK

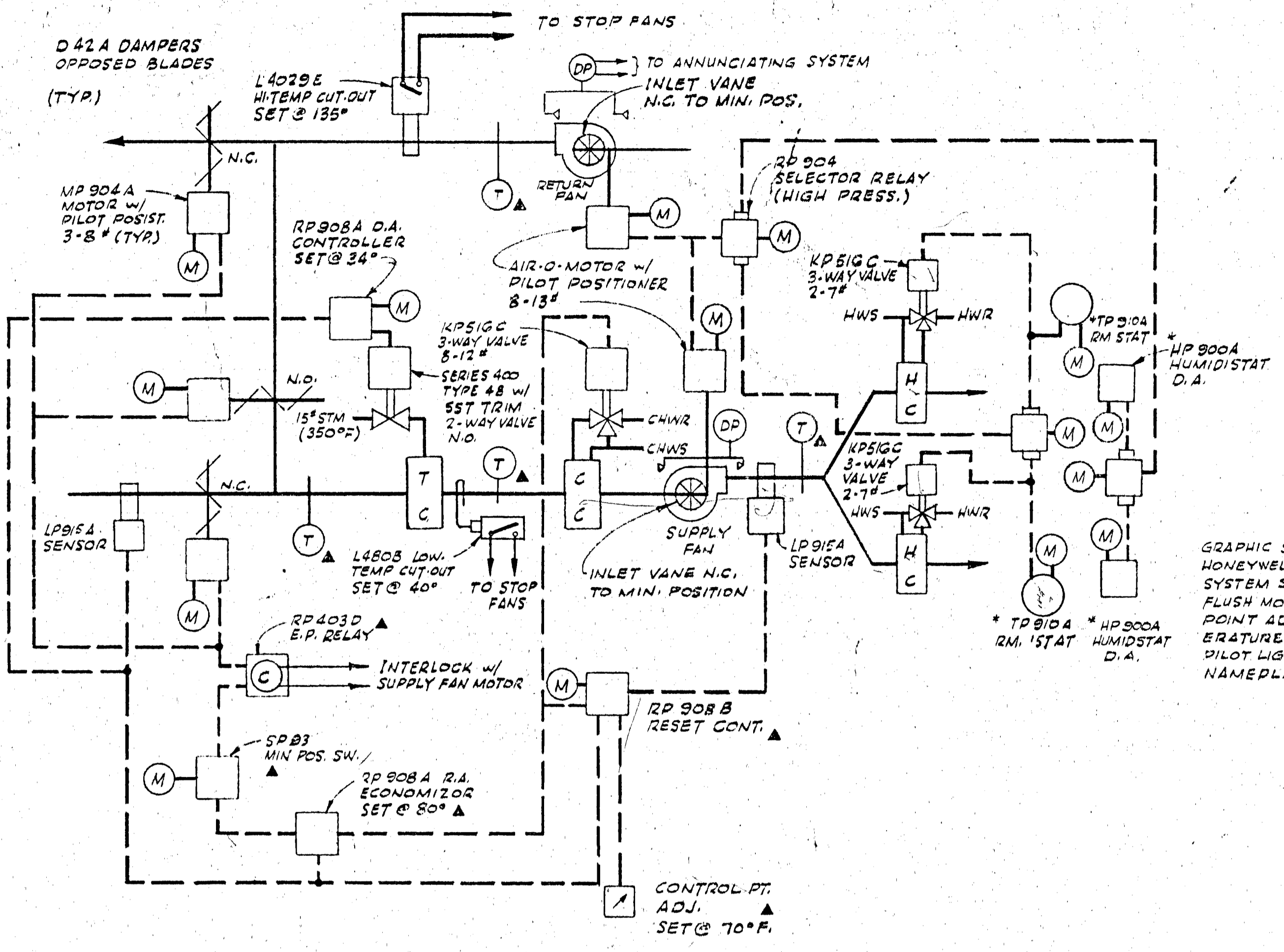
AIR CONDITIONING HEATING & VENTILATING DETAILS

WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
IAN PREGNOFF & MATHEU STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-524-8664

DR. ROESSL	CHKD. / APPD.	SCALE
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T.H. Cain	LAB NUCLEAR STUDIES	SHEET 58 OF 102
DATE NOV. 16, 1966	DATE JAN. 15, 1966	DRAWING NO. M-12
		WMB & A NO. 1115

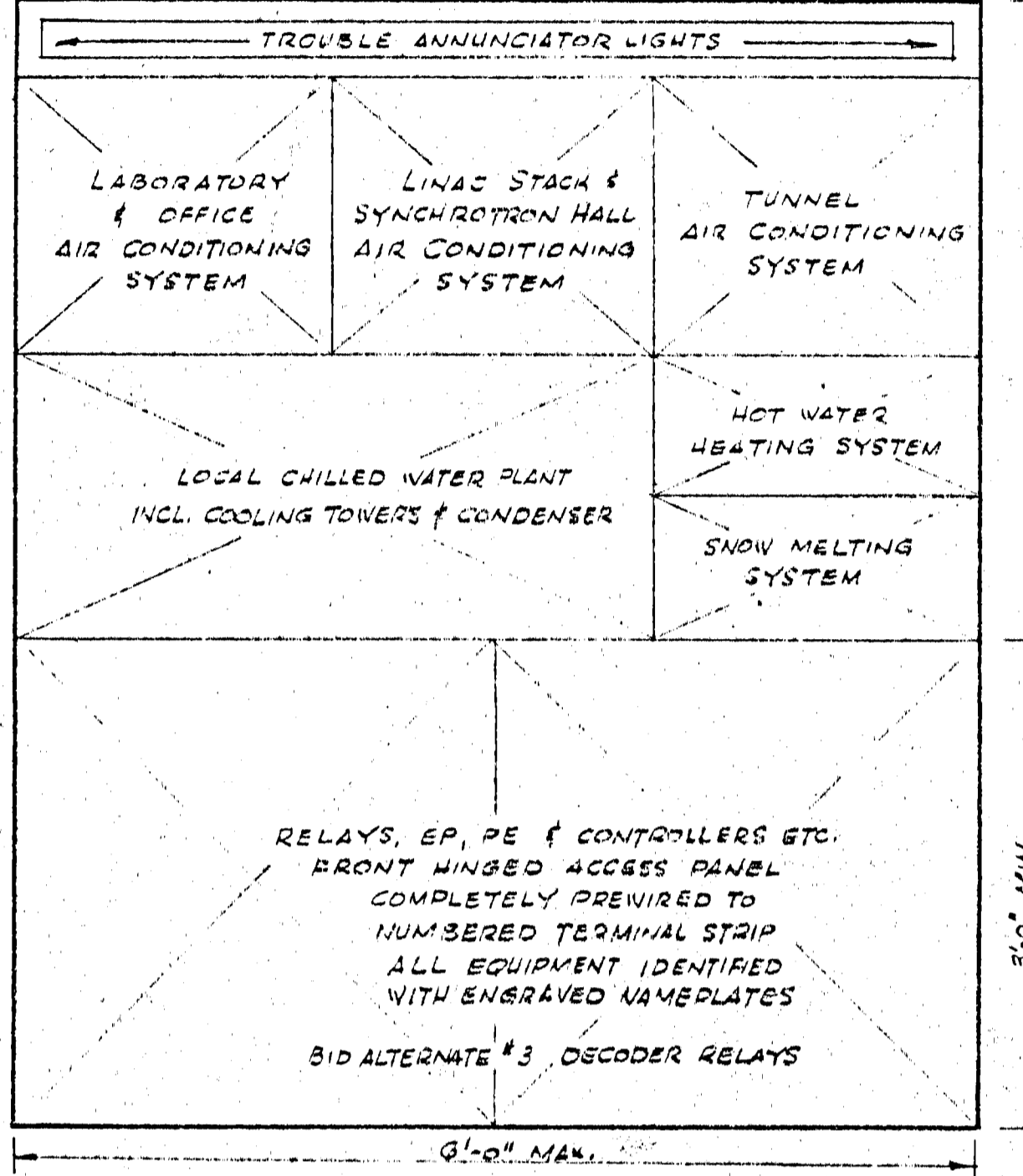


AIR CONDITIONING SYSTEM CONTROL
TYPICAL FOR LAB-OFFICE SYSTEM & LINAC STACK-SYNCHROTRON HALL SYSTEM



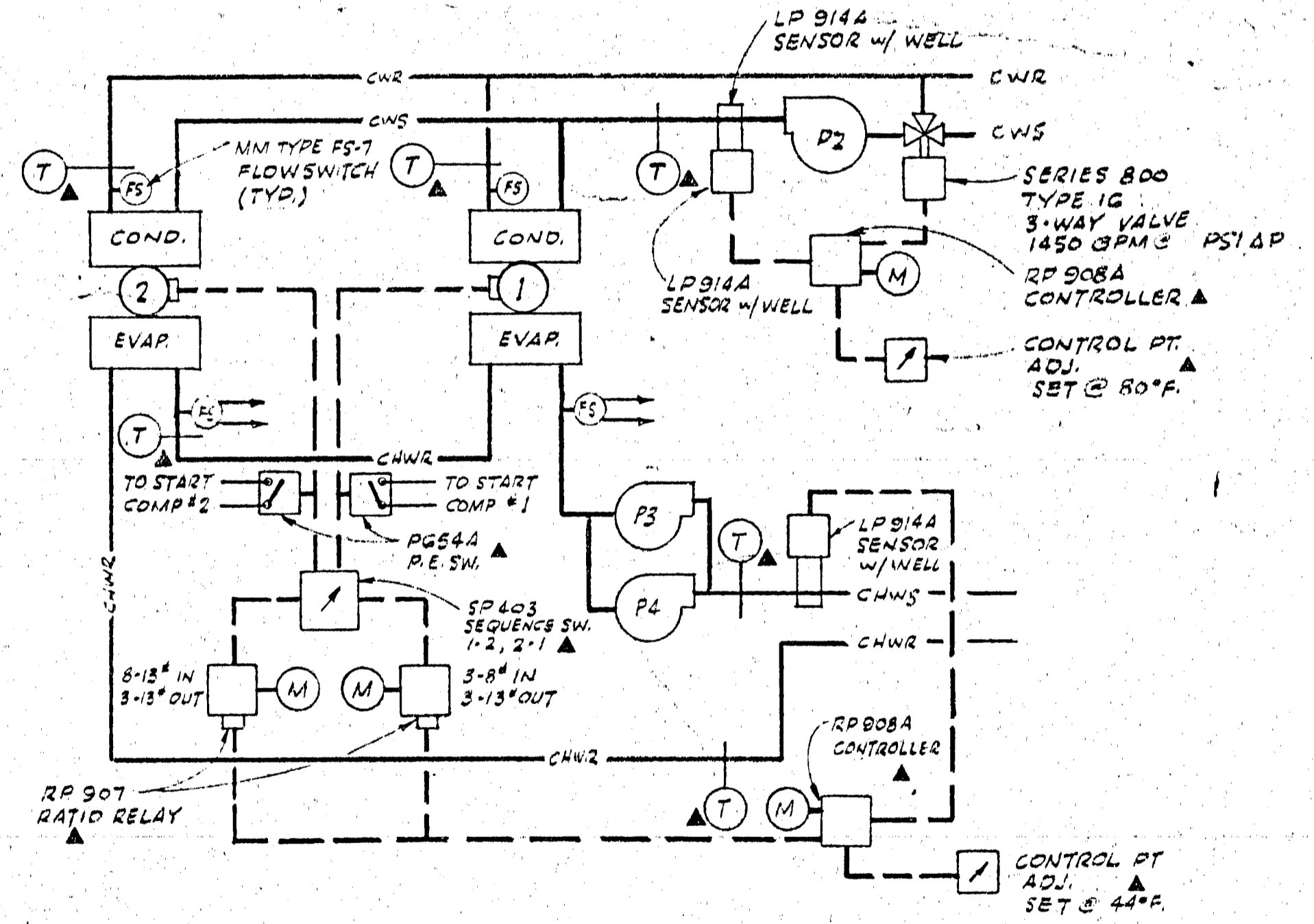
TUNNEL AIR-CONDITIONING SYSTEM CONTROL
* THERMOSTATS & HUMIDISTS SHALL BE LOCATED IN THE EAST & WEST BEAM TUNNELS.

- LEGEND**
- (M) MAIN CONTROL AIR
 - (T) TEMPERATURE INDICATOR # RC2100
 - ▲ CONTROL PANEL MOUNTED
 - SST STAINLESS STEEL TRIM
 - TC TEMPERING COIL (STEAM)
 - CC COOLING COIL (CHILLED WATER)
 - HC ZONE REHEAT COIL
 - FC FLOW SWITCH
 - (PS) DIFFERENTIAL PRESSURE SWITCH
 - N.C. NORMALLY CLOSED
 - N.O. NORMALLY OPEN
 - E.P. ELECTRIC PNEUMATIC SWITCH
 - P.E. PNEUMATIC ELECTRIC SWITCH
- NOTES**
- 1 FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG M1.
 - 2 CONTROL COMPONENT MODEL NUMBERS INDICATED ARE HONEYWELL.
 - 3 FOR FLOW CAPACITY REQUIREMENTS OF COIL CONTROL VALVES REFER TO THE FOLLOWING DRAWINGS:
 - ZONE REHEAT COILS M1
 - TEMPERING COILS M8
 - COOLING COILS M9
 - 4 ALL TEMPERATURE INDICATORS SHALL CONSIST OF AN LP914 OR LP915A SENSOR AS INDICATED WITH RC2100 INDICATOR WITH AN ACCURACY ± 1% OF SCALE.
 - 5 ALL OUT SENSORS EXCEPT OUTSIDE AIR SHALL BE LP915A WITH 20FT. LONG AVERAGING ELEMENT.

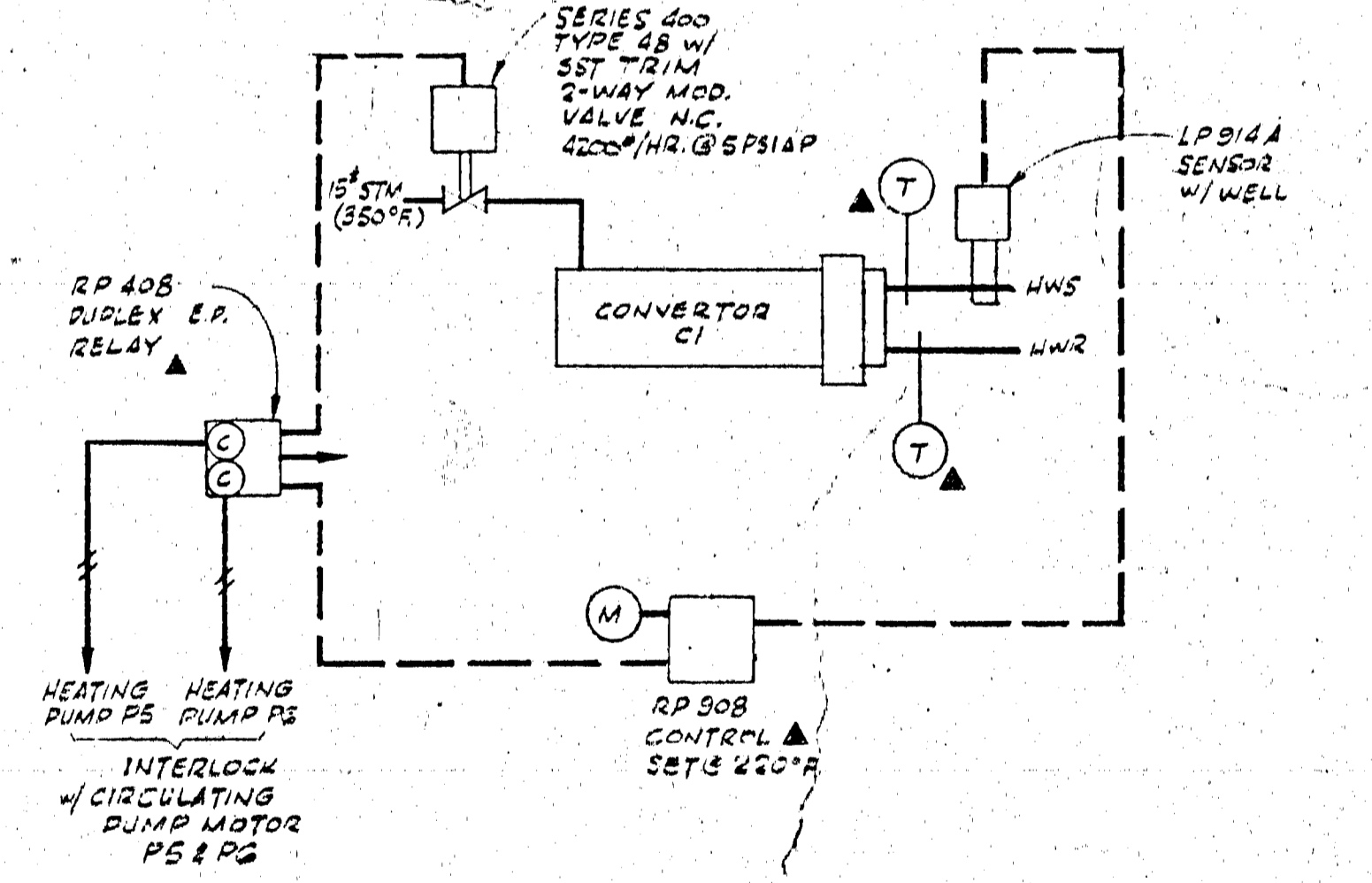


CONTROL PANEL ELEVATION
NO SCALE

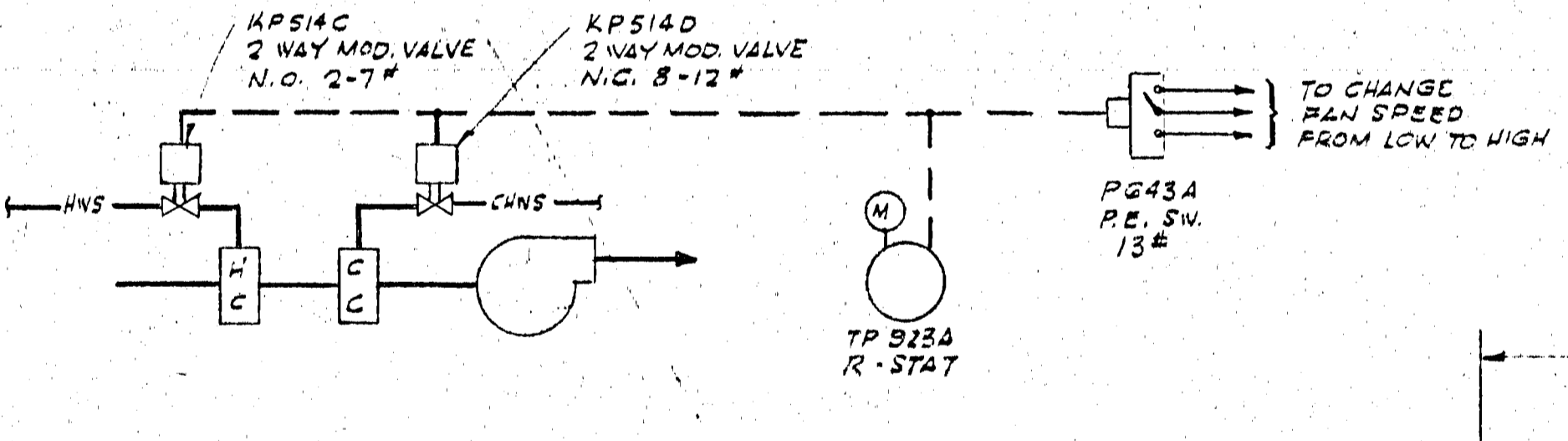
- NOTES**
- 1 PROVIDE TOP & SIDE ACCESS TO GRAPHIC SECTION OF PANEL.
 - 2 ELECTRIC CONTROL WIRING & ANNUNCIATOR FURNISHED AND INSTALLED UNDER THE ELECTRICAL SECTION OF THE SPECIFICATION - SEE DWGS E 18 & E 19.
 - 3 ALL WALL MOUNTED THERMOSTATS SHALL BE LOCATED 5'-0" ABOVE FLOOR.



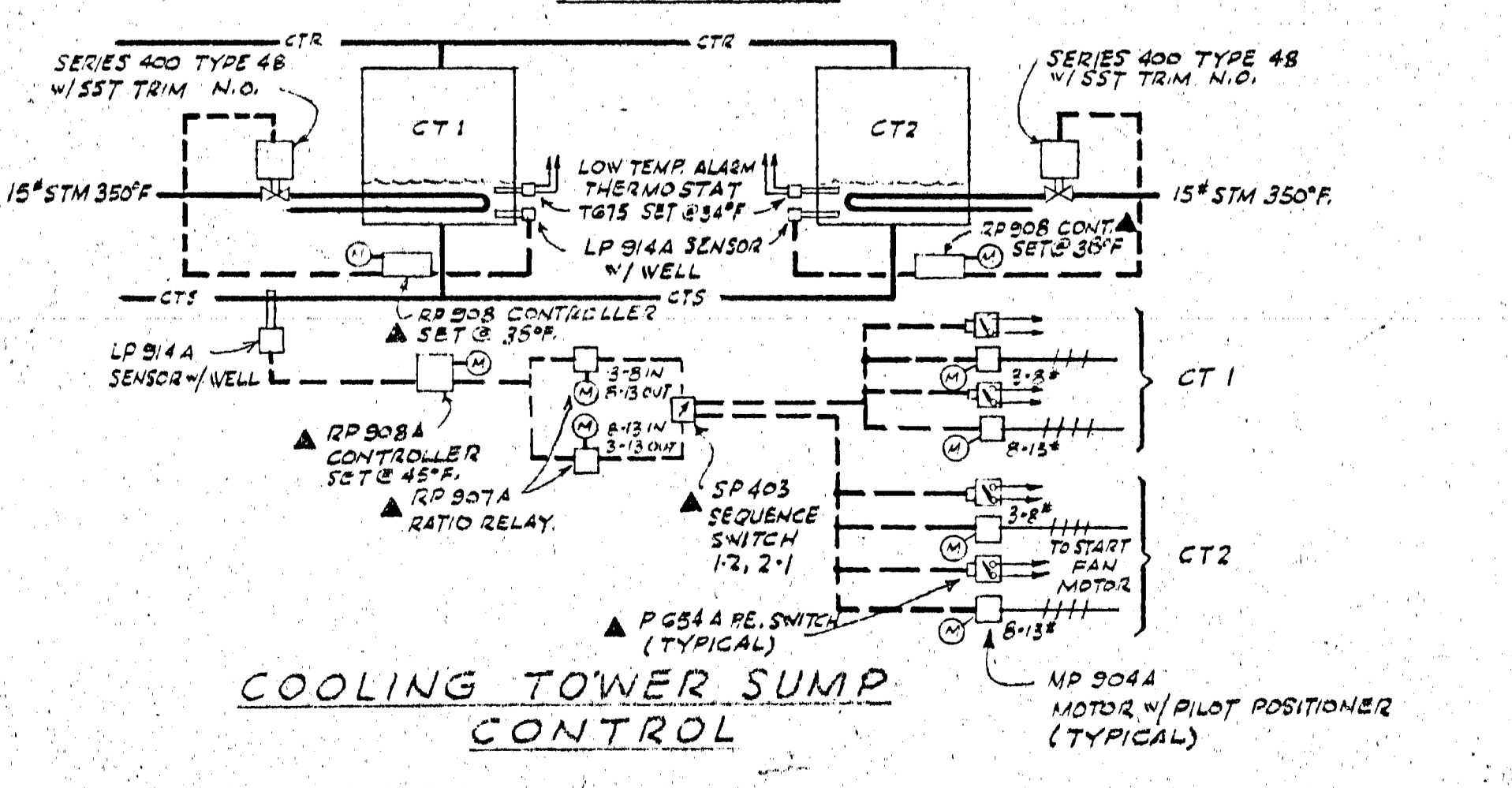
CHILLED & CONDENSER WATER CONTROL



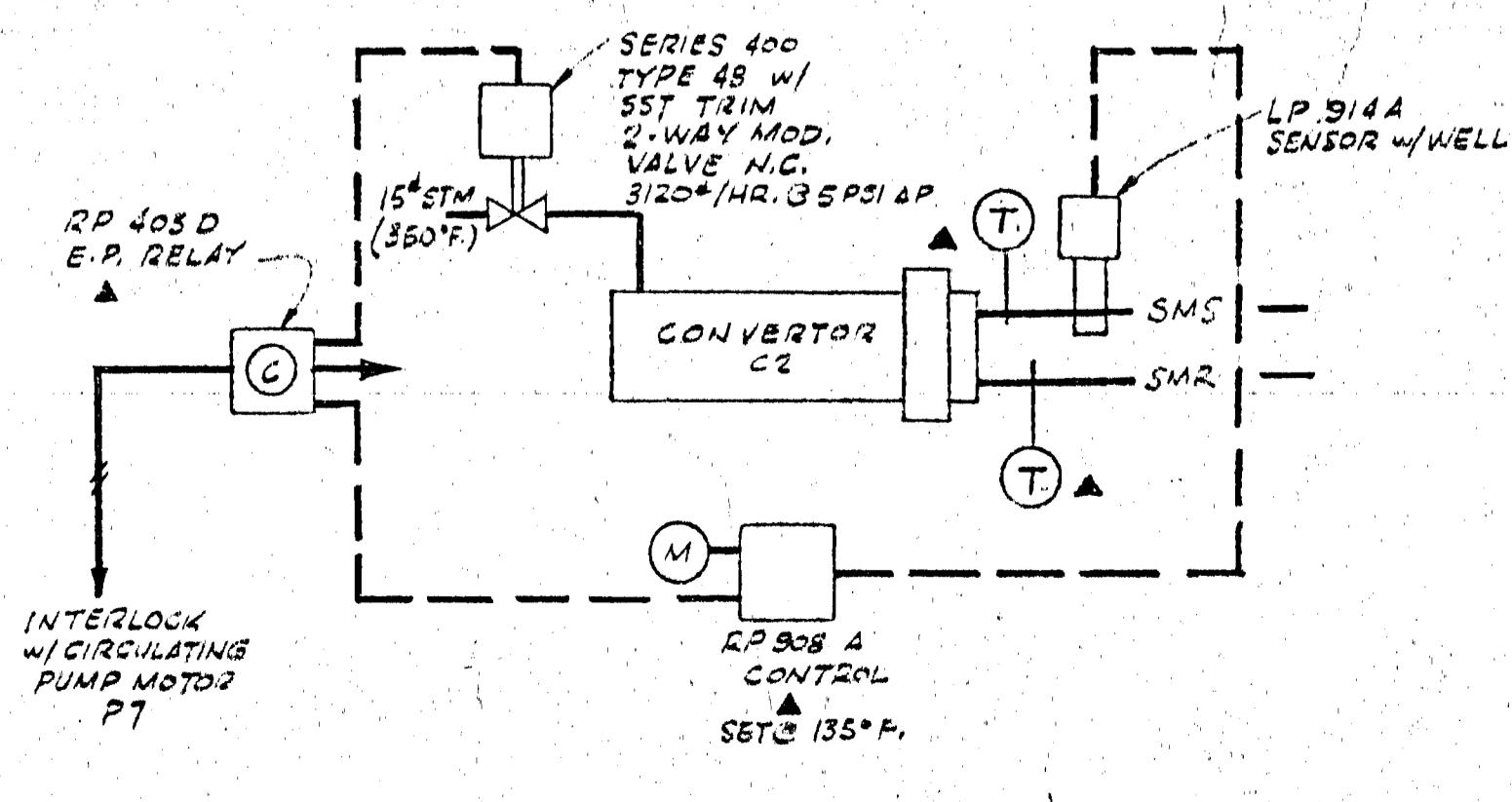
H.T.G. H.W. CONVERTOR CONTROL



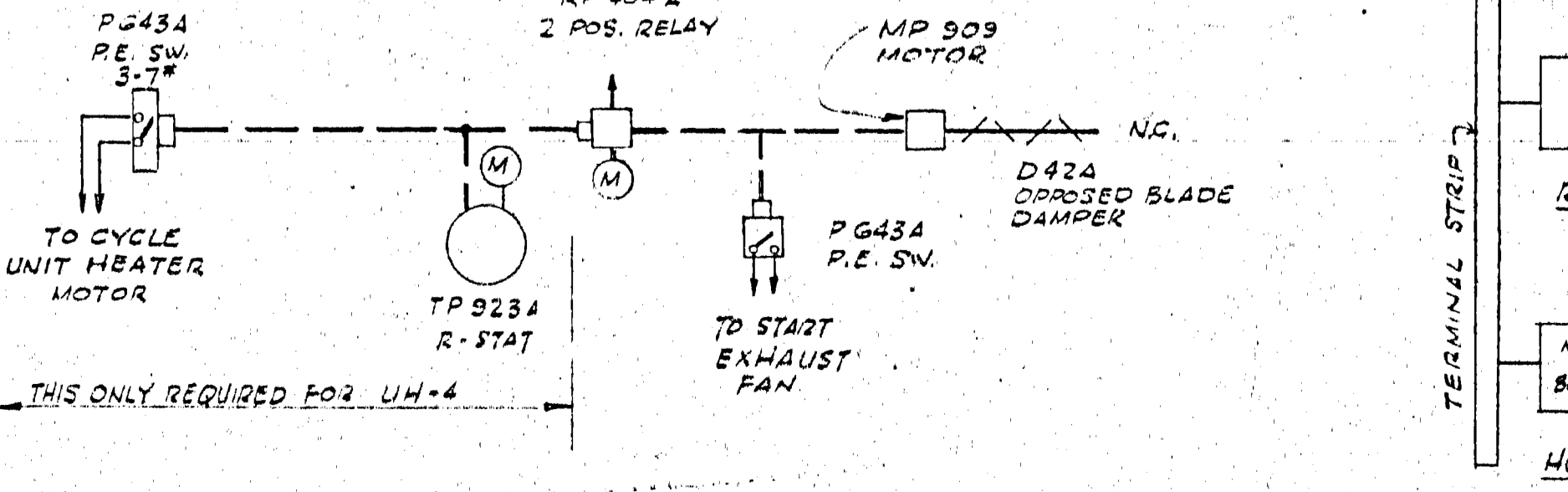
FAN COIL UNIT CONTROL



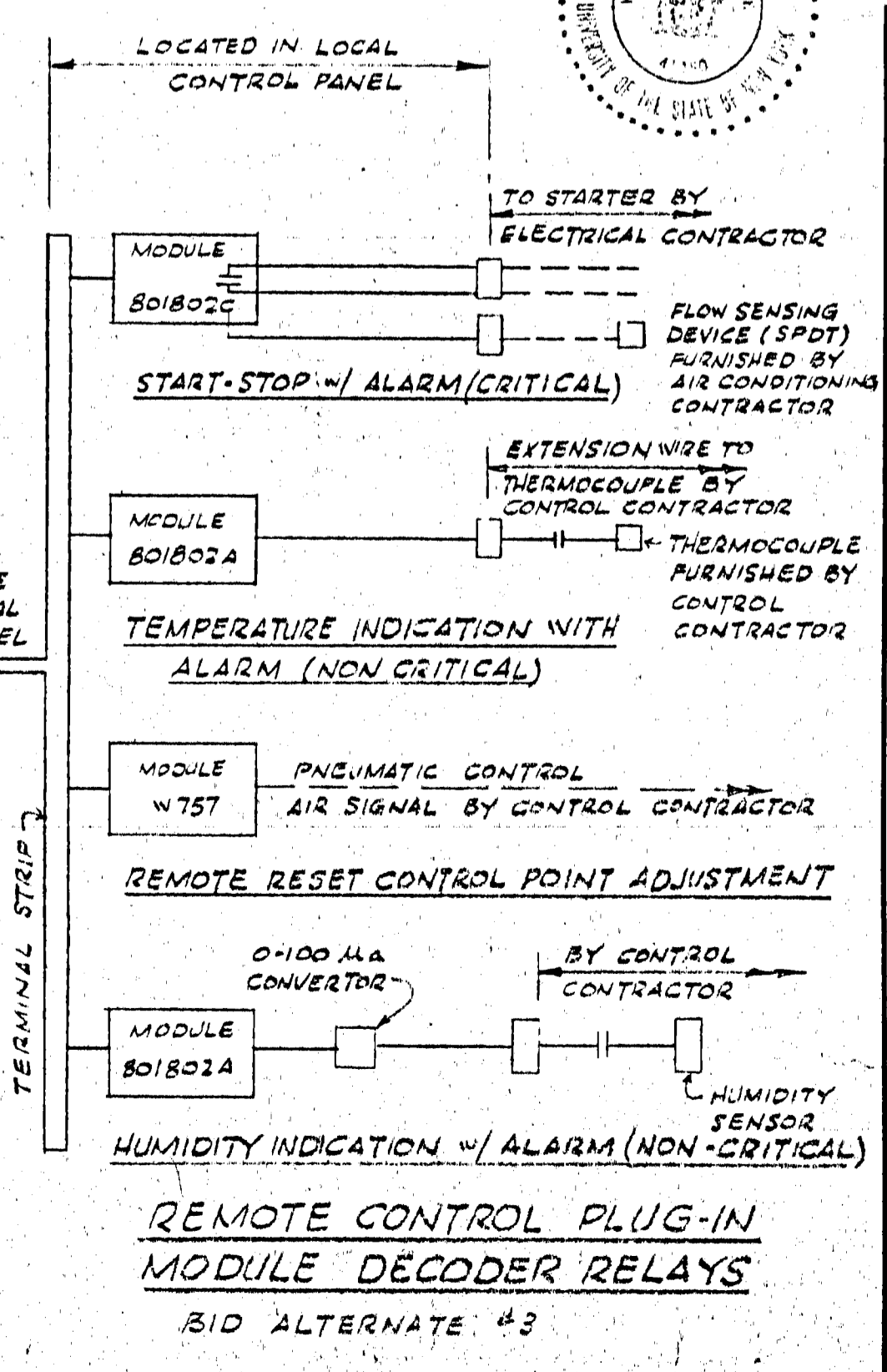
COOLING TOWER SUMP CONTROL



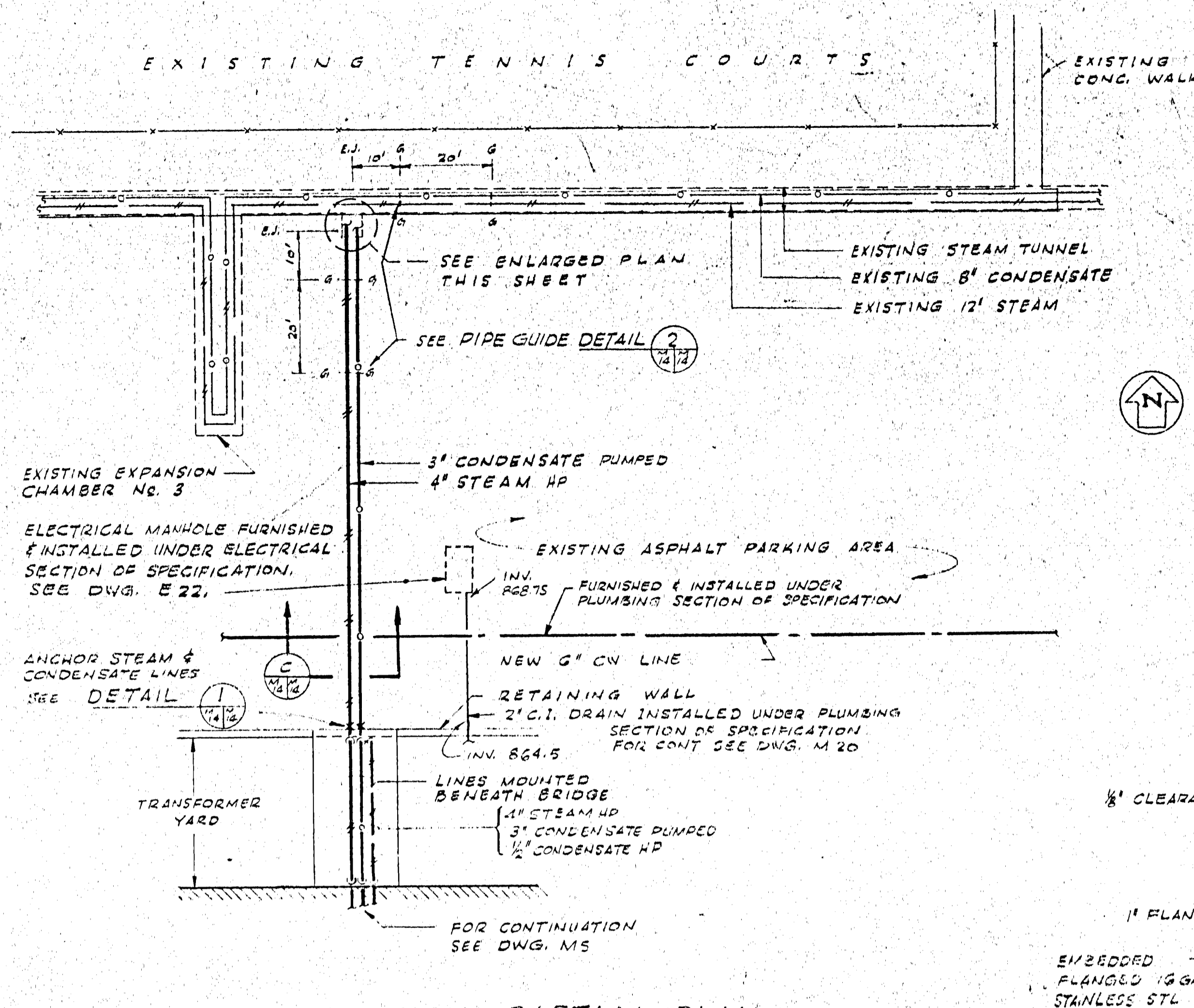
SNOW MELTING CONVERTOR CONTROL



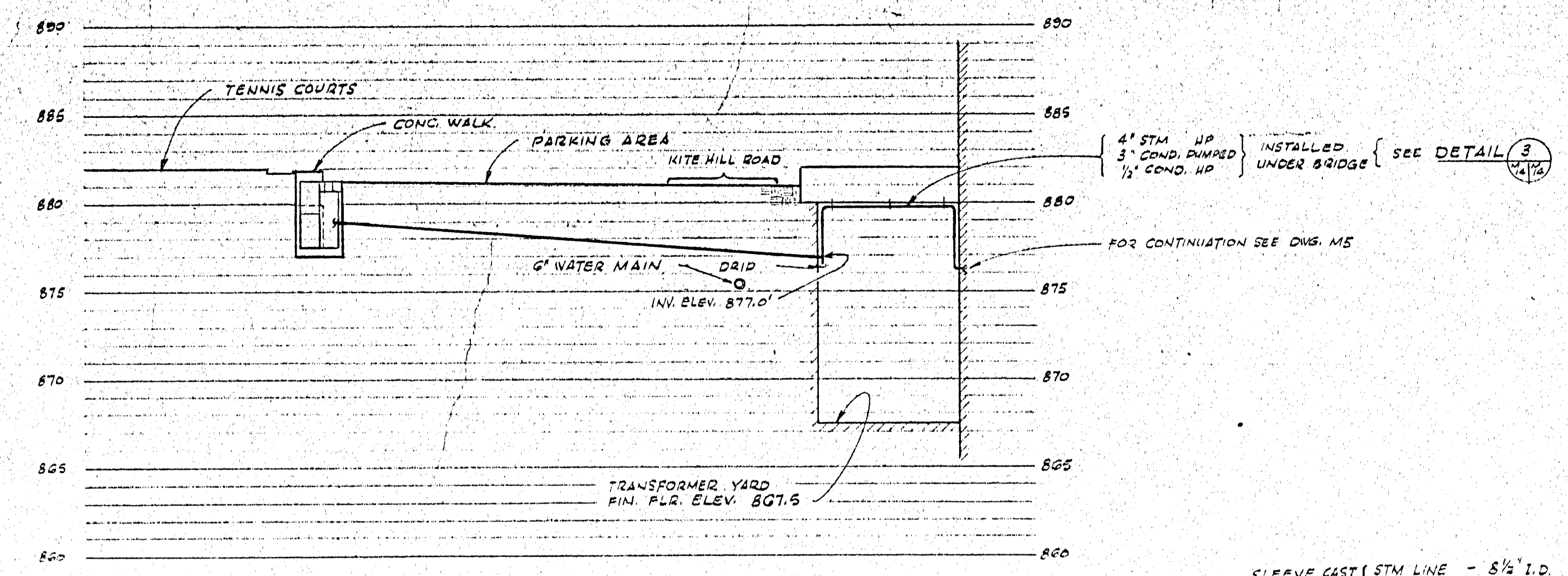
UNIT HEATER AND SF CONTROL



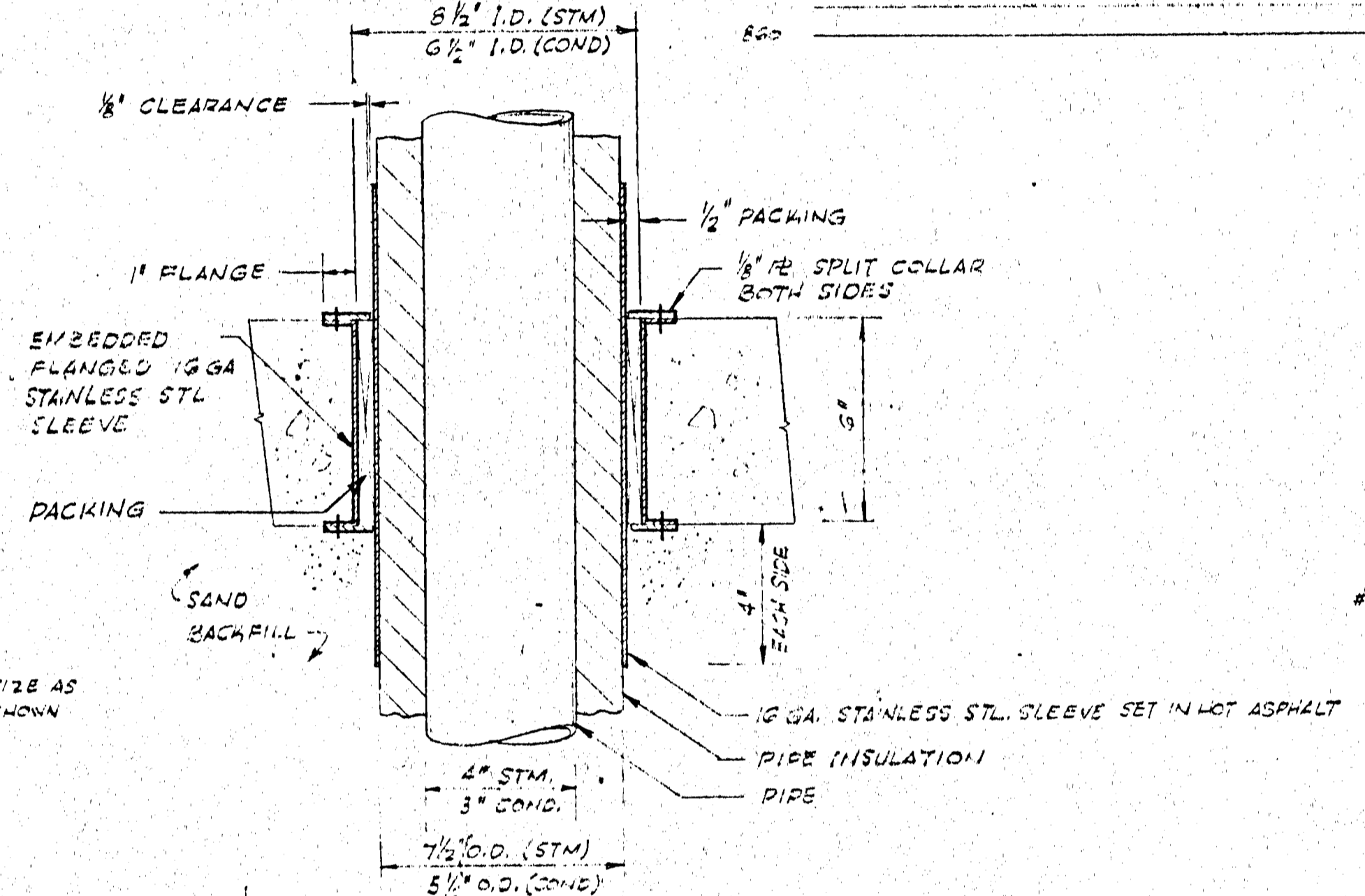
I/O GEV CORNELL SYNCHROTRON LABORATORY CORNELL UNIVERSITY ITHACA NEW YORK	
AIR CONDITIONING HEATING & VENTILATING CONTROLS	
WILLIAM M. BROBECK AND ASSOCIATES IAN MACKINLAY, AIA ARCHITECT PREGONOFF & MATHEU STRUCTURAL ENGR. JACOBS ASSOCIATES CONSTRUCTION ENGR. 950 GILMAN ST. BERKELEY, CALIF. 94710 TELEPHONE 415-524-8664	
DR. ROESSL, CHK'D BY SUPPLY UNIT	SCALE NONE
RELEASED	APPROVED
SHEET 59 OF 102	DRAWING NO. M13
DATE NOV. 16, 1966	DATE JAN. 15, 1966
APPROVED FOR CONSTRUCTION	



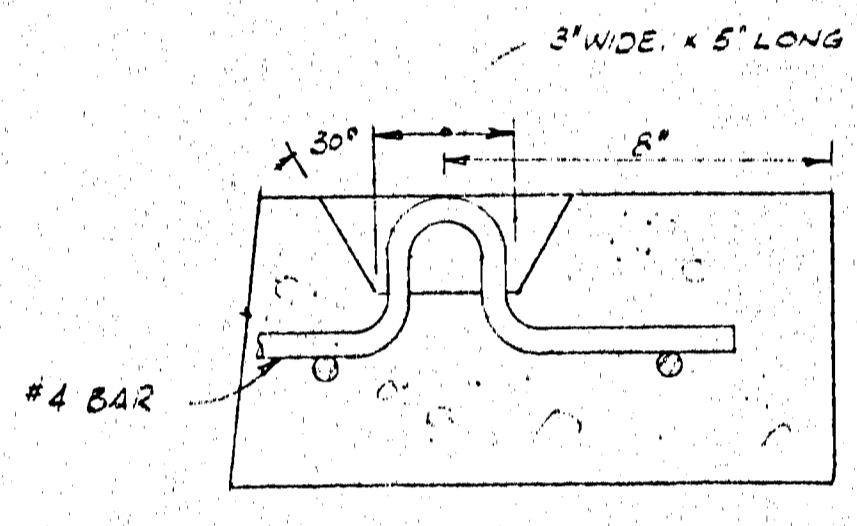
STEAM DISTRIBUTION - PARTIAL PLAN
SCALE 1" = 20'



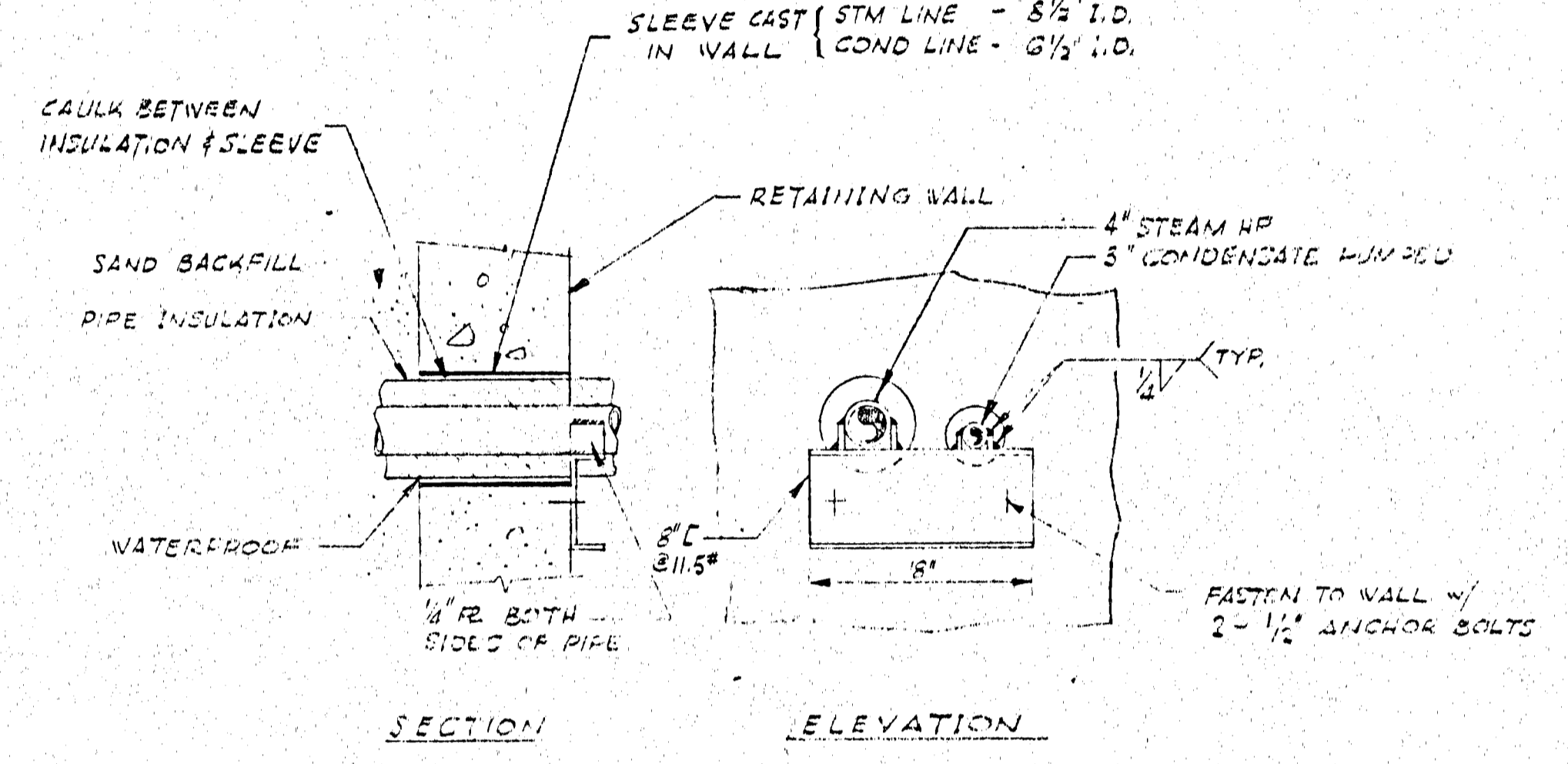
PROFILE
HORIZ. SCALE 1" = 20'
VERT. SCALE 1" = 5'



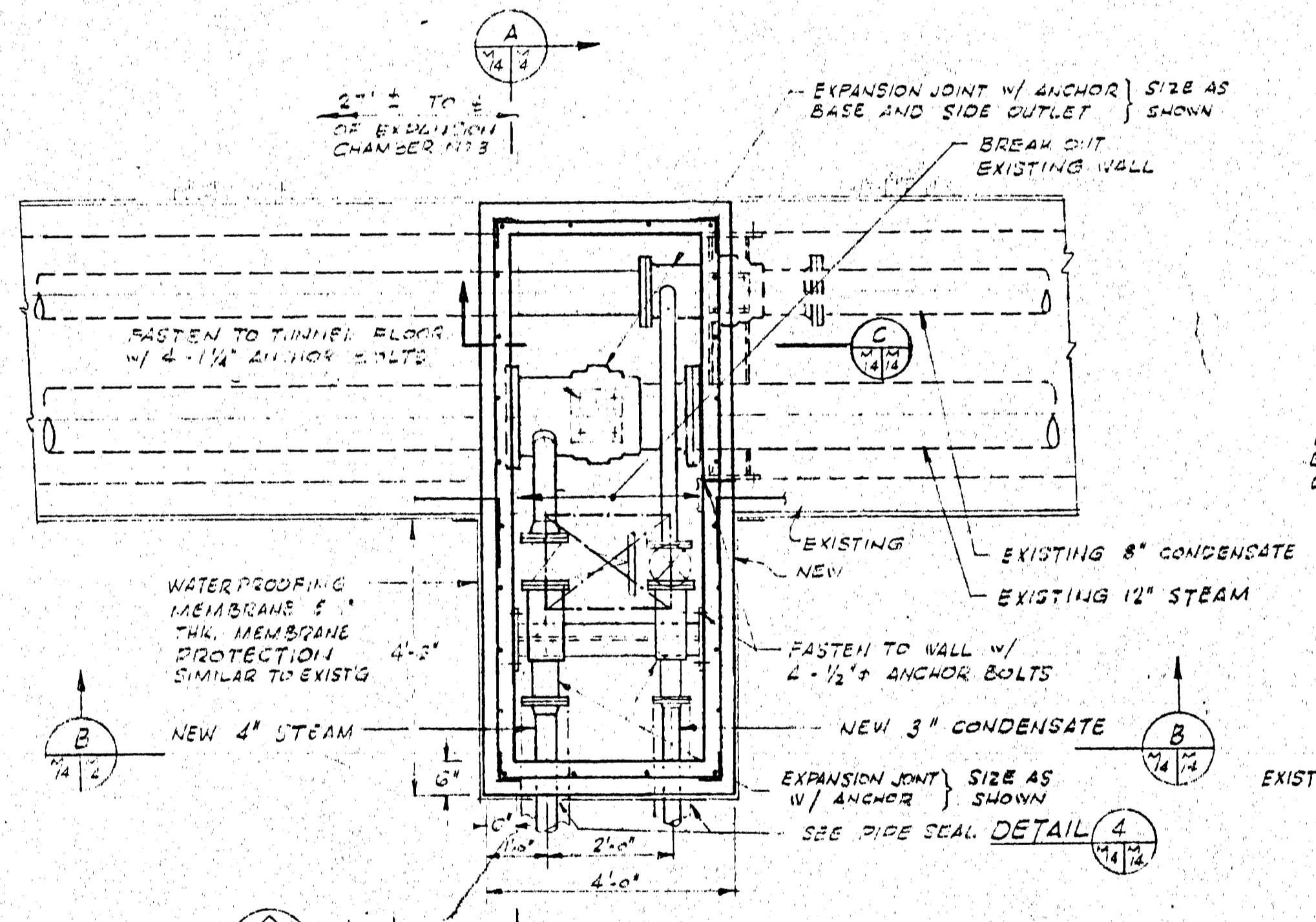
PIPE SEAL DETAIL (4)
SCALE 1/2" = 1'-0"



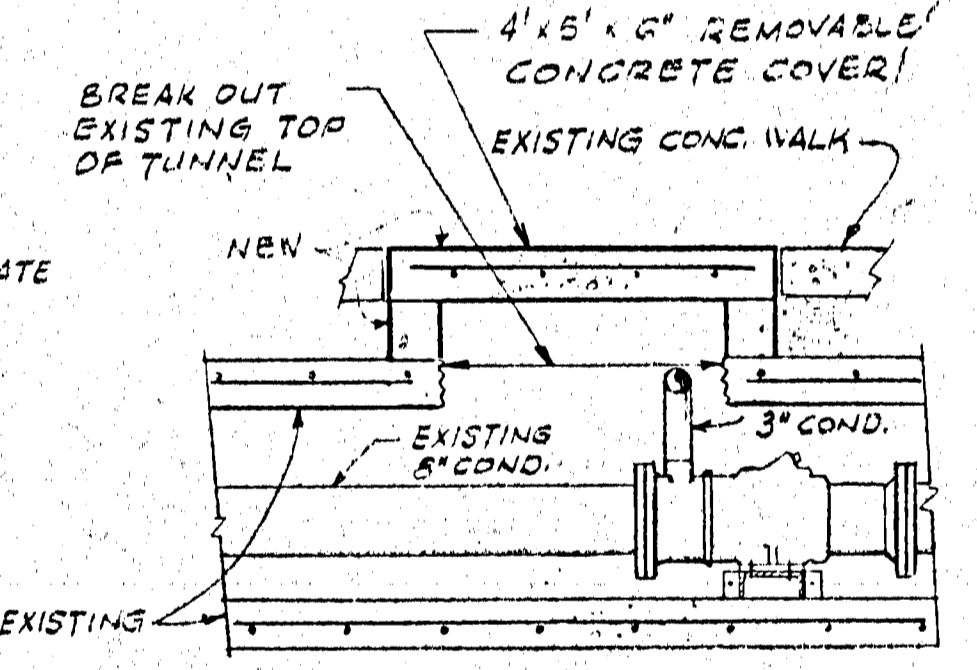
LIFTING EYE DETAIL (5)
SCALE 1/2" = 1'-0"



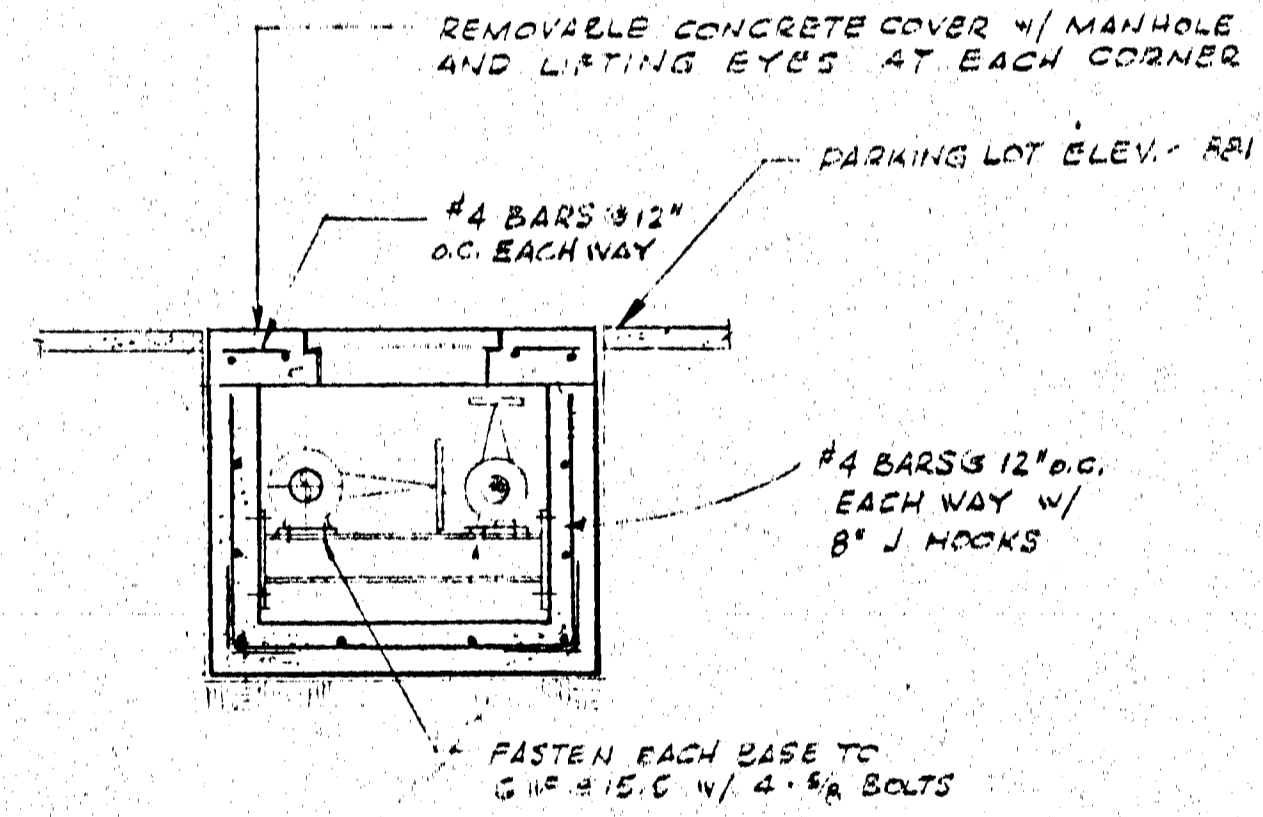
SECTION ELEVATION
PIPE ANCHOR DETAIL (1)
SCALE 1/2" = 1'-0"



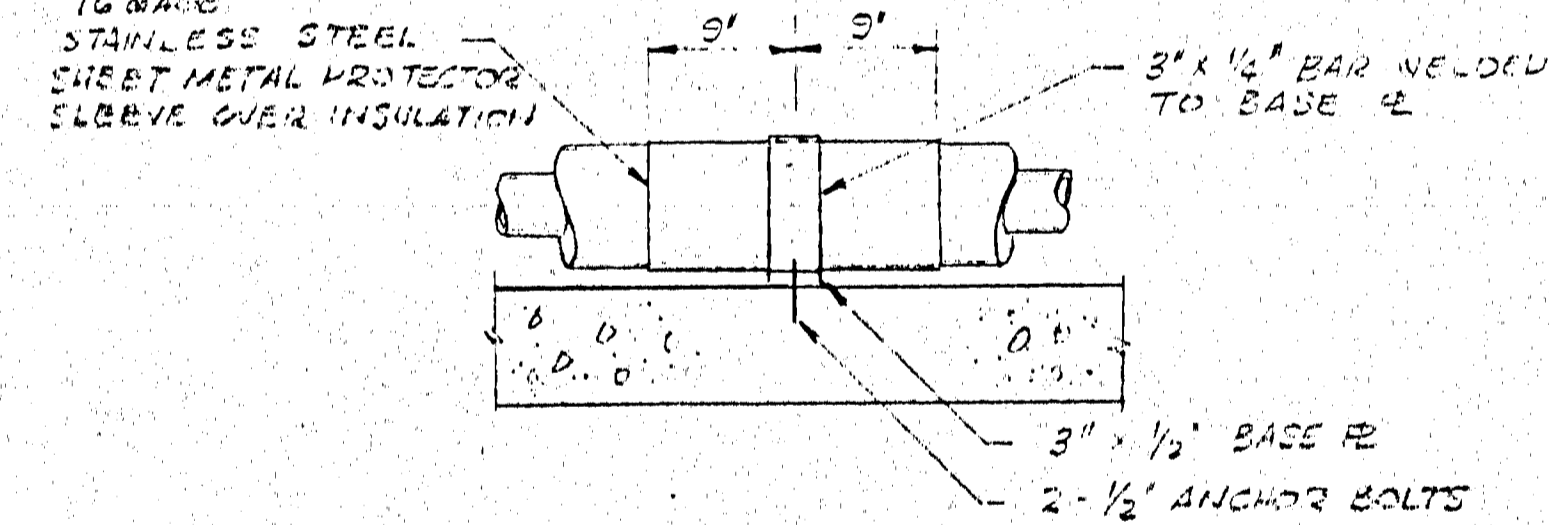
PLAN AT MANHOLE
SCALE 1/2" = 1'-0"



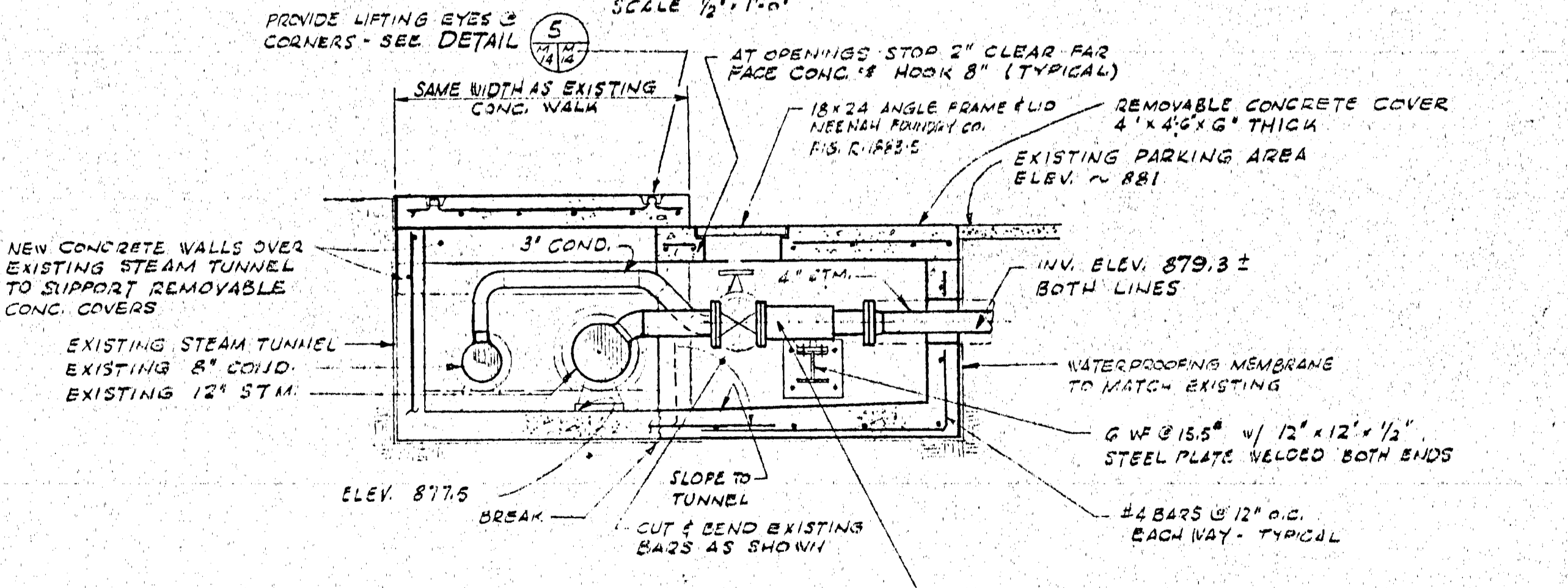
SECTION C
SCALE 1/2" = 1'-0"



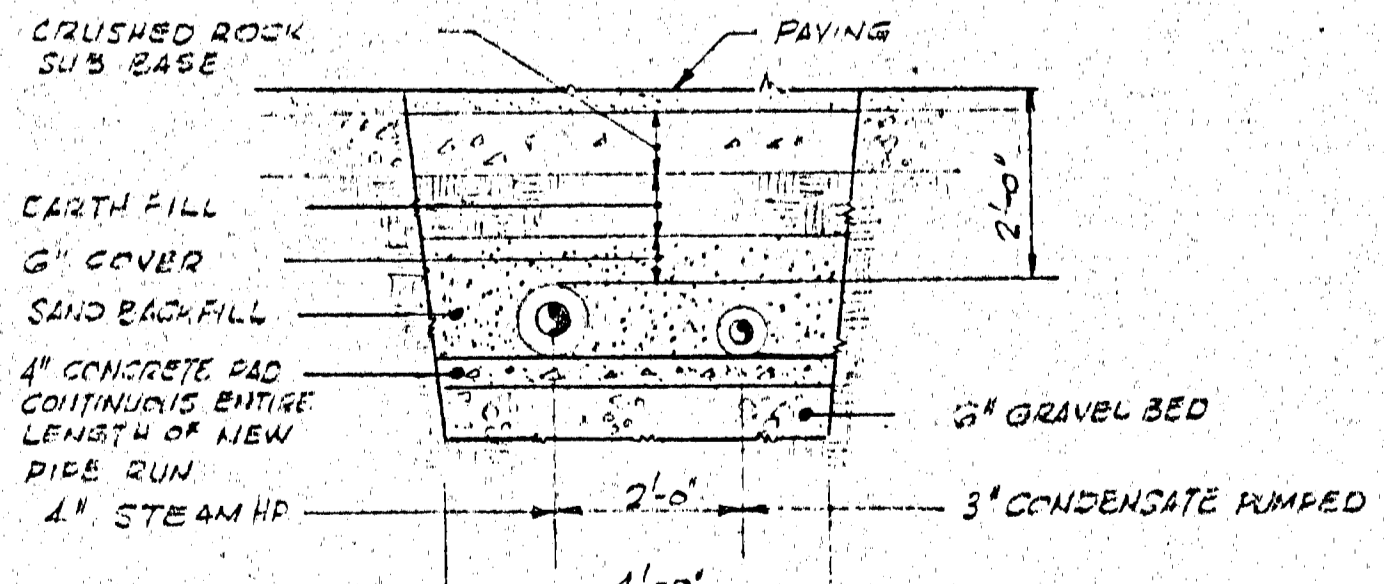
SECTION B
SCALE 1/2" = 1'-0"



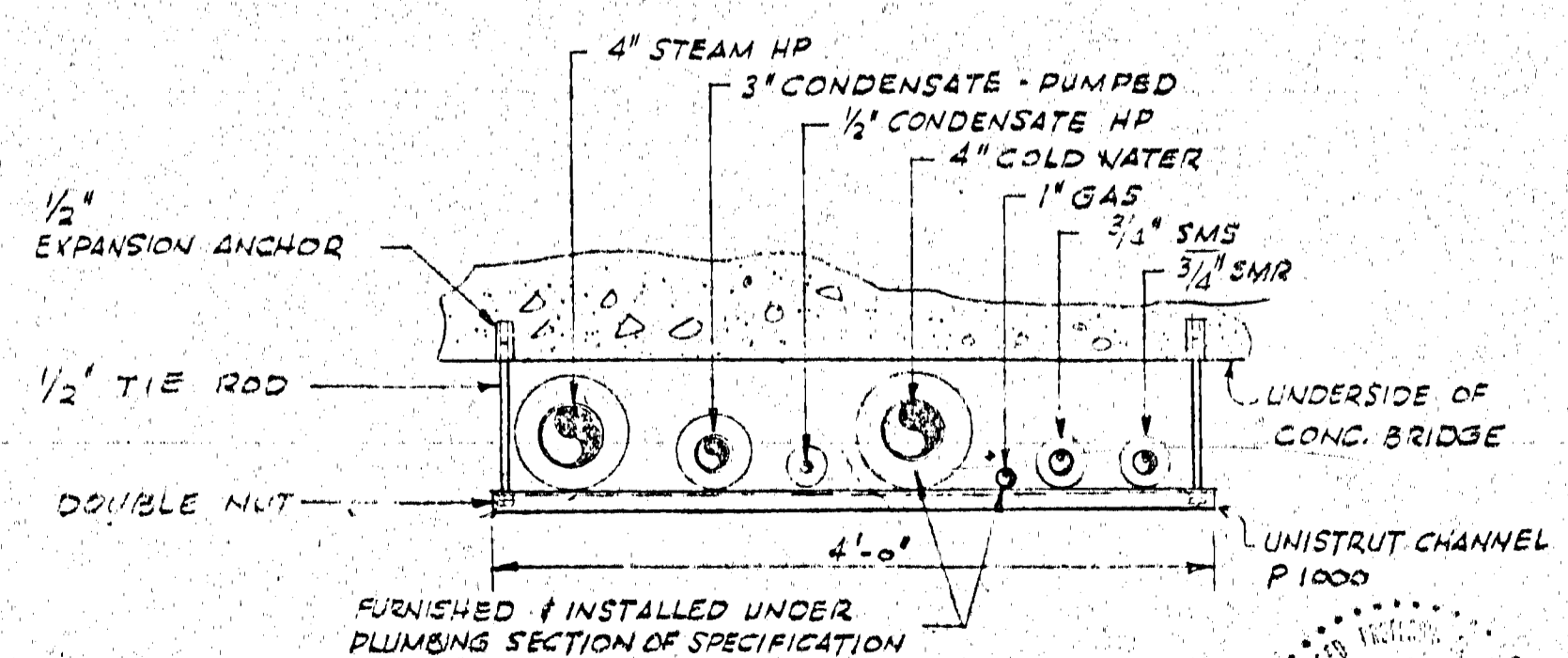
PIPE GUIDE DETAIL (2)
SCALE 1/2" = 1'-0"



SECTION A
SCALE 1/2" = 1'-0"



SECTION C
SCALE 1/2" = 1'-0"



PIPE HANGER DETAIL (3)
SCALE 1/2" = 1'-0"

NOTE:
1. FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG. M1.

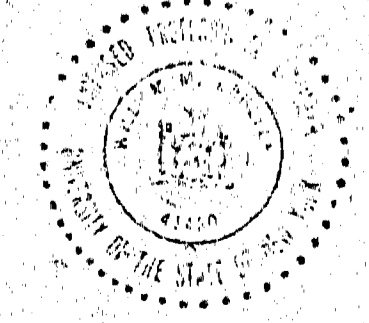
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CONSTRUCTION

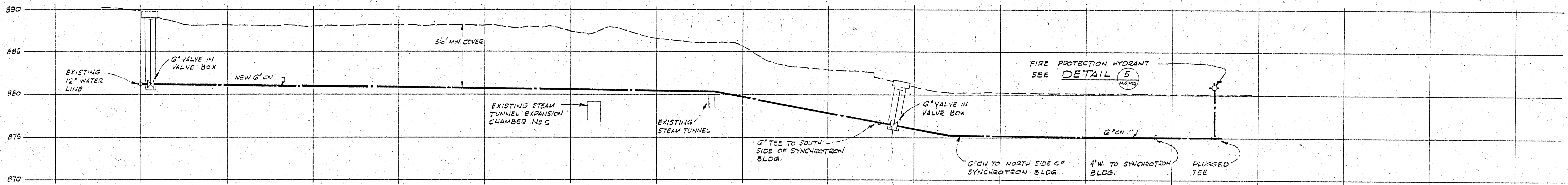
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SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA NEW YORK

AIR CONDITIONING
HEATING & VENTILATING
STEAM DISTRIBUTION
PLAN & DETAILS

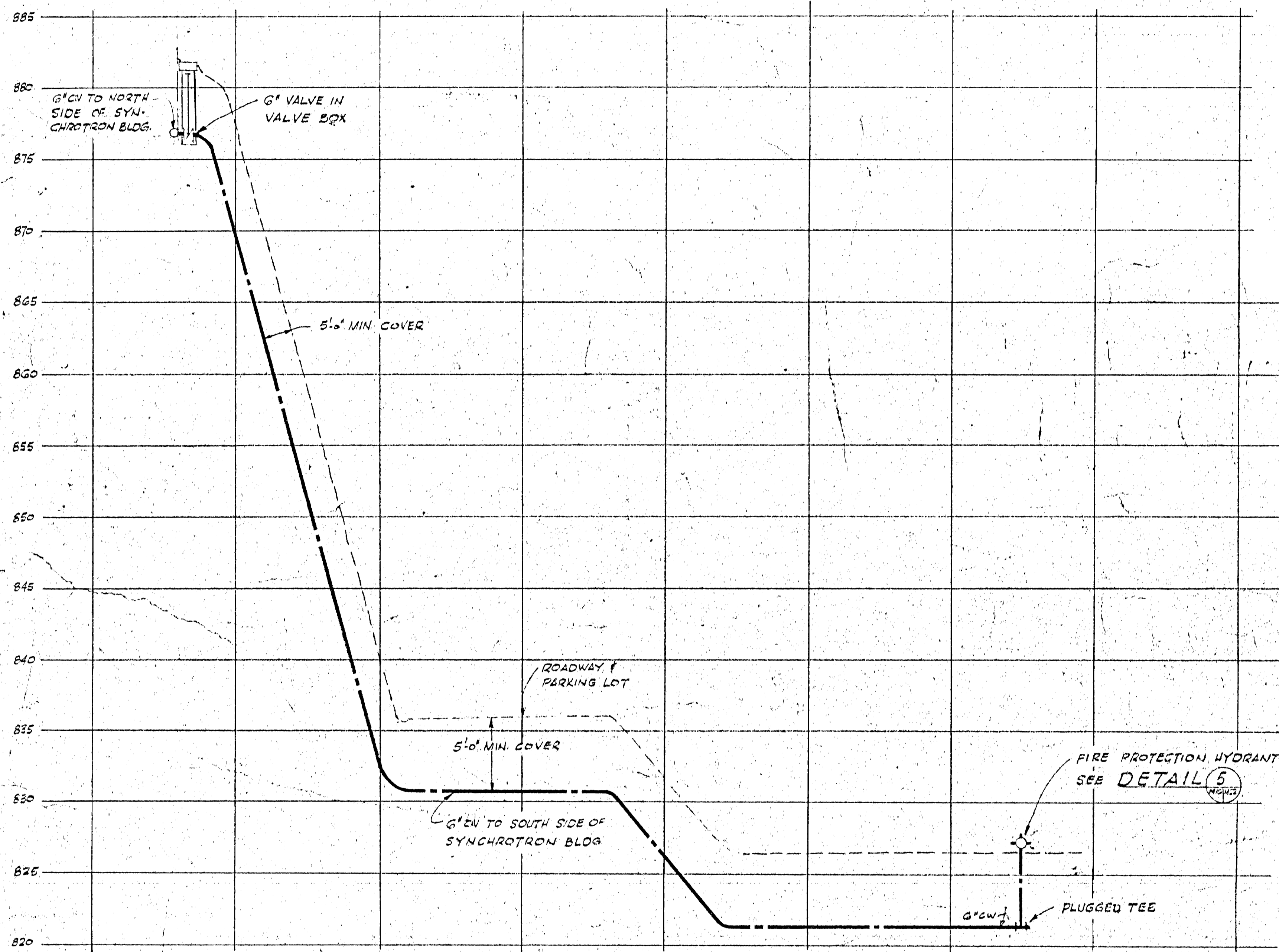
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IAN MACKINLAY, AIA ARCHITECT
JACOBS ASSOCIATES STRUCTURAL ENGR.
950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-524-8664

DATE	BY	CHKD	APPD	SCALE
DR. 12/26/55	CHKD 1/11/57	SUPV 1/11/57		1/2" = 1'-0"
RELEASED	APPROVED	SHEET	OF	
T.H. Lane	LAB NUCLEAR STUDIES	50	102	
DATE NOV. 15, 1956	V.P.-BUSINESS	DRAWING NO.		
	DATE JULY 15, 1956	WMB & A NO. 1115		

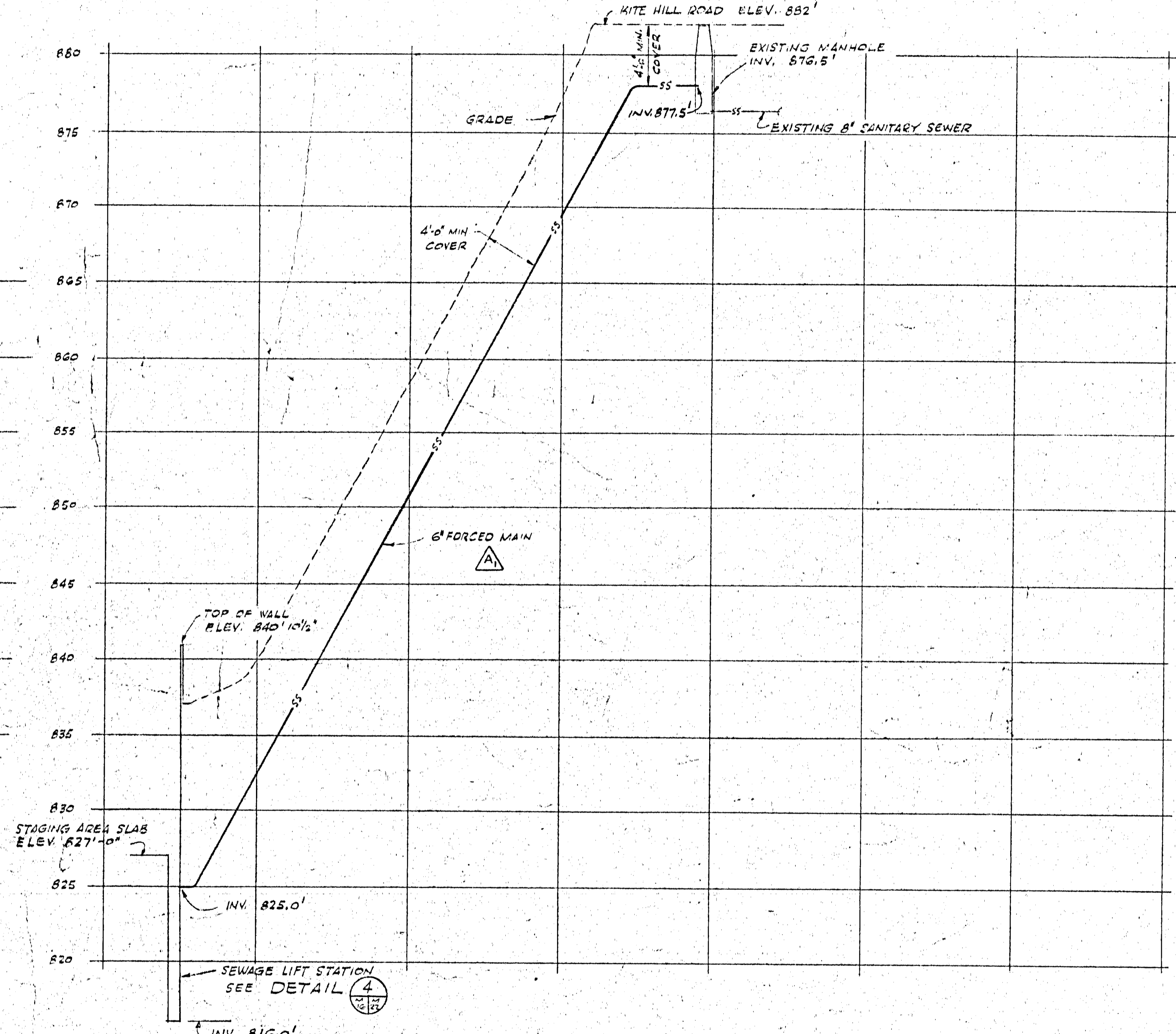




WATER LINE PROFILE
 HORIZ. SCALE 1" = 50'
 VERT. SCALE 1" = 5'

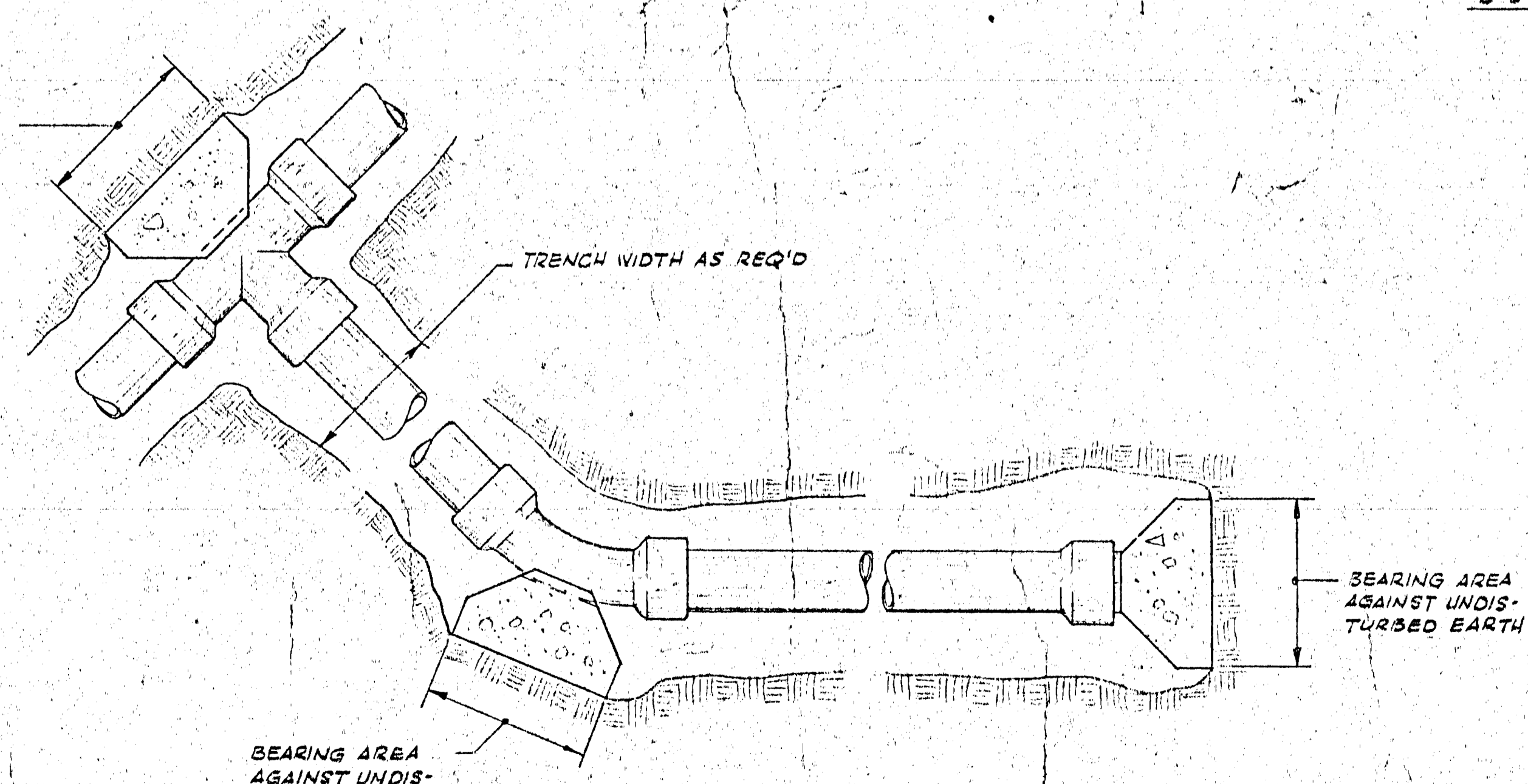


WATER LINE PROFILE
 HORIZ. SCALE 1" = 50'
 VERT. SCALE 1" = 5'



SEWER LINE PROFILE
 HORIZ. SCALE 1" = 50'
 VERT. SCALE 1" = 5'

FITTING	BEARING - 33 LB	
	WATER MAIN	SEWER FORCE MAIN
TEE	6	3
PLUG	6	3
1/4 BEND 90°	12	6
1/8 BEND 45°	6	3
1/16 BEND 22 1/2°	4	2
1/32 BEND 11 1/4°	4	2



THRUST BLOCK DETAILS
 CONCRETE THRUST BLOCK TO BEAR AGAINST UNDISTURBED EARTH

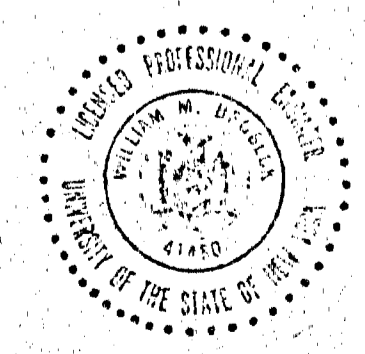
NOTE
 FOR LEGEND REFER TO DWG. M 15

CHANGED FROM 4" TO 6" AGREE WOTHER DWGS.	5-23-64	GM	GM	GM
	DATE	CHK'D	APP'D	APP'D

10 GEV CORNELL SYNCHROTRON LABORATORY
 CORNELL UNIVERSITY
 ITHACA, NEW YORK

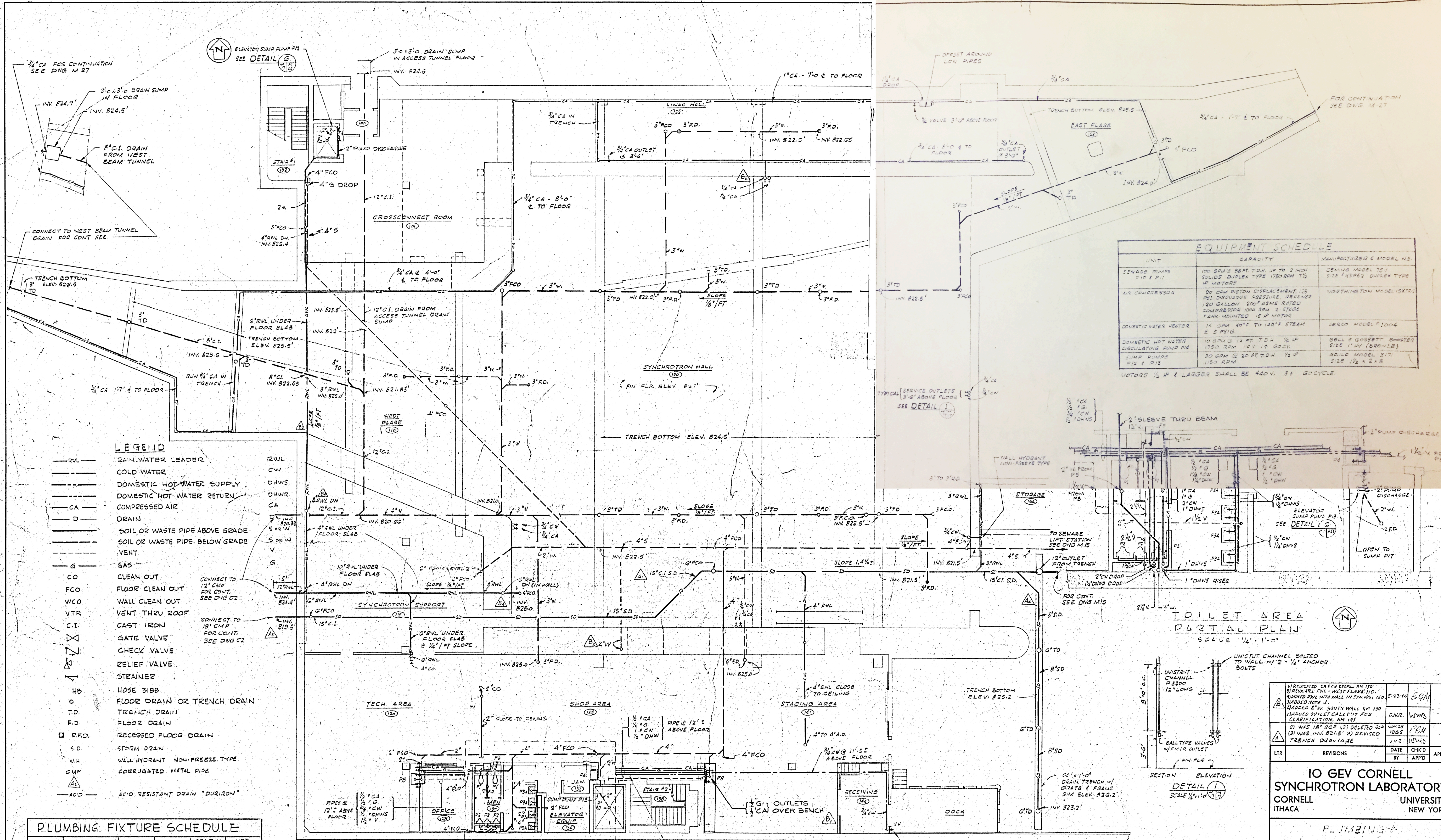
PLUMBING UTILITIES
 WATER & SEWER
 PROFILES

WILLIAM M. BROBECK AND ASSOCIATES
 IAN MACKINLAY, AIA ARCHITECT
 PREGNOFF & MATHEU STRUCTURAL ENGR.
 JACOBS ASSOCIATES CONSTRUCTION ENGR.
 950 GILMAN ST. BERKELEY, CALIF. 94710
 TELEPHONE 415 - 524 - 8664



DR. ROESL	CHK'D	DATE	SCALE
RELEASED	APPROVED	SHEET	OF
J.H. Clave		G2	102
LAB NUCLEAR STUDIES		DRAWING NO.	
W.M. Brobeck	Y.P. BUSINESS	MIG	
DATE NOV. 15, 1963	DATE JAN. 15, 1964	WMB & A. NO. 1115	

APPROVED FOR CONSTRUCTION



LEGEND

—RVL—	RAIN WATER LEADER	RVL	RAIN WATER LEADER
—CW—	COLD WATER	CW	COLD WATER
—DHW—	DOMESTIC HOT WATER SUPPLY	DHW	DOMESTIC HOT WATER SUPPLY
—DHW-R—	DOMESTIC HOT WATER RETURN	DHW-R	DOMESTIC HOT WATER RETURN
—CA—	COMPRESSED AIR	CA	COMPRESSED AIR
—D—	DRAIN	D	DRAIN
—S.O.—	SOIL OR WASTE PIPE ABOVE GRADE	S.O.	SOIL OR WASTE PIPE ABOVE GRADE
—S.O.B.—	SOIL OR WASTE PIPE BELOW GRADE	S.O.B.	SOIL OR WASTE PIPE BELOW GRADE
—V—	VENT	V	VENT
—G—	GAS	G	GAS
—CO—	CLEAN OUT	CO	CLEAN OUT
—FCO—	FLOOR CLEAN OUT	FCO	FLOOR CLEAN OUT
—WCO—	WALL CLEAN OUT	WCO	WALL CLEAN OUT
—VTR—	VENT THRU ROOF	VTR	VENT THRU ROOF
—C.I.—	CAST IRON	C.I.	CAST IRON
—G.V.—	GATE VALVE	G.V.	GATE VALVE
—C.V.—	CHECK VALVE	C.V.	CHECK VALVE
—R.V.—	RELIEF VALVE	R.V.	RELIEF VALVE
—S.—	STRAINER	S.	STRAINER
—H.B.—	HOSE BIBB	H.B.	HOSE BIBB
—O—	FLOOR DRAIN OR TRENCH DRAIN	O	FLOOR DRAIN OR TRENCH DRAIN
—T.D.—	TRENCH DRAIN	T.D.	TRENCH DRAIN
—F.D.—	FLOOR DRAIN	F.D.	FLOOR DRAIN
—R.F.D.—	RECESSED FLOOR DRAIN	R.F.D.	RECESSED FLOOR DRAIN
—S.D.—	STORM DRAIN	S.D.	STORM DRAIN
—W.H.—	WALL HYDRANT NON-FREEZE TYPE	W.H.	WALL HYDRANT NON-FREEZE TYPE
—CMP—	CORRUGATED METAL PIPE	CMP	CORRUGATED METAL PIPE
—A.C.—	ACID RESISTANT DRAIN "DURIRON"	A.C.	ACID RESISTANT DRAIN "DURIRON"

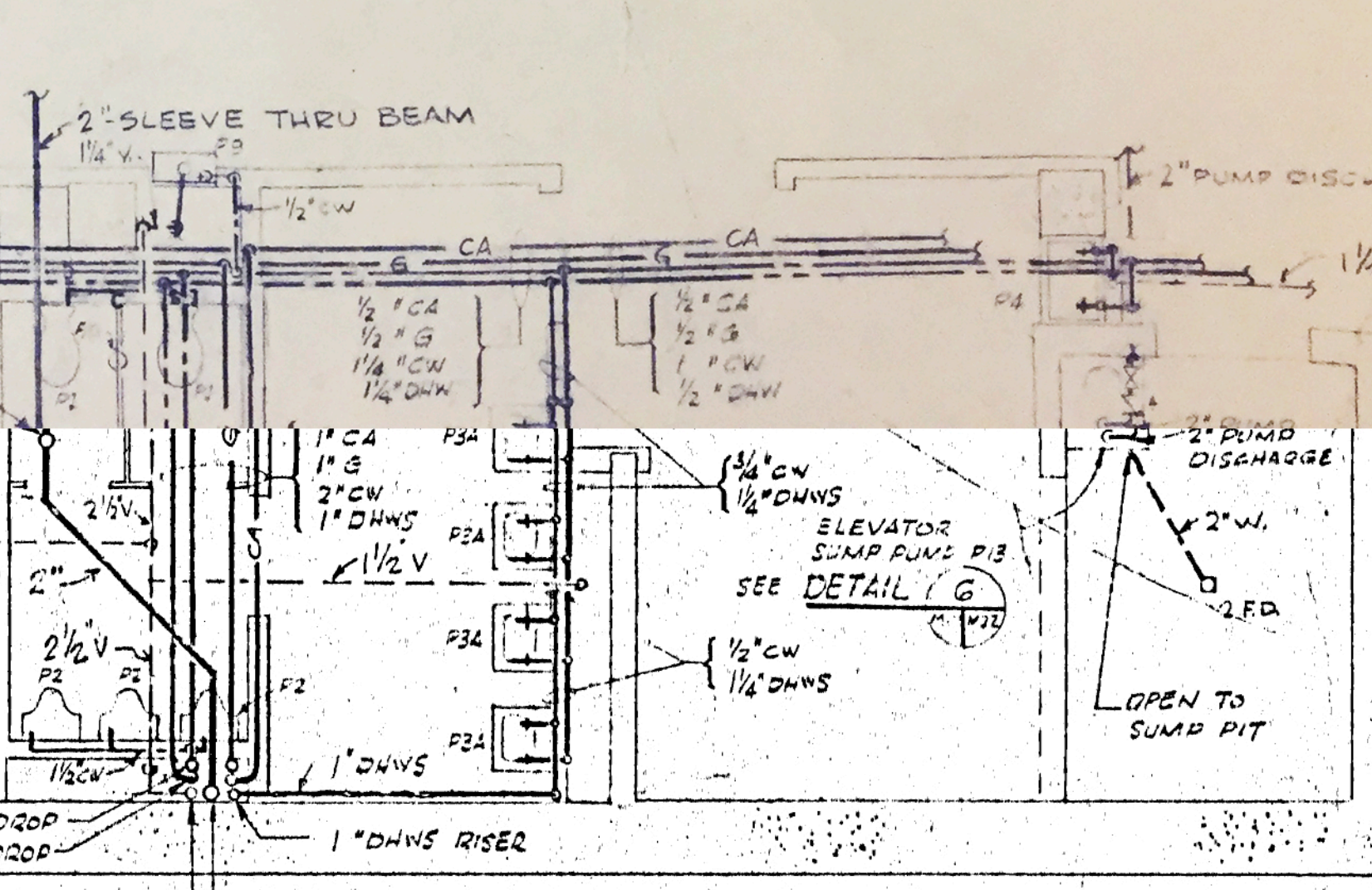
PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE	TRAP	VENT	COLD WATER	HOT WATER
P1	WATER CLOSET	3"	2"	1"	—
P2	URINAL	2"	1 1/2"	1"	—
P3A/B	LAVATORY	1 1/2"	1 1/4"	1/2"	1/2"
P4	SERVICE SINK	3"	1 1/2"	1/2"	1/2"
P5	LAB. SINK	1 1/2"	1 1/4"	2 - 1/2"	1/2"
P6	DARK ROOM SINK	1 1/2"	1 1/4"	1/2"	1/2"
P7	KITCHEN SINK	1 1/2"	1 1/4"	1/2"	1/2"
P8	SHOP SINK	1 1/2"	1 1/4"	2 - 1/2"	1/2"
P9	DRINKING FOUNTAIN	1 1/4"	1 1/4"	1/2"	—
P10	STALL SHOWER	1 1/2"	1 1/4"	1/2"	1/2"

EQUIPMENT SCHEDULE

UNIT	CAPACITY	MANUFACTURER & MODEL NO.
SEWAGE PUMPS P1 & P11	100 GPM & 8 FT. TD. UP TO 2 INCH SOLIDS DUPLEX TYPE 1750 RPM 7 1/2 HP MOTORS	CEMUS MODEL 721 SIS *KSEK DUPLEX TYPE
AIR COMPRESSOR	80 CUB. INCH DISPLACEMENT 125 PSI DISCHARGE PRESSURE DELIVERER 120 GALLON 2000 RPM 2 STAGE COMPRESSOR 1000 RPM 2 STAGE TANK MOUNTED 15 HP MOTOR	WORTHINGTON MODEL 18XTR
DOMESTIC WATER HEATER	14 GPM 40°F TO 140°F STEAM @ 5 PSIG	HERCO MODEL #1004
DOMESTIC HOT WATER CIRCULATING PUMP	10 GPM @ 12 FT. TD. 1/2 HP 1750 RPM 12 V 1.9 300V	BELL & HOWELL BOOSTER SEE 114V (SCHEDULE)
SUMP PUMPS P12 & P13	30 GPM @ 20 FT. TD. 7 1/2 HP 1150 RPM	BOLID MODEL 317 S12 1 1/2 x 2 x 8

MOTORS 1/2 HP & LARGER SHALL BE 400V. 3Φ 60CYCLE



REVISIONS

NO.	DESCRIPTION	DATE	CHKD	APPD
1	RELOCATED CA 1/2\"/>			

**IO GEV CORNELL
SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA, NEW YORK**

**PLUMBING & LABORATORY SERVICES
LEVEL #1
PLAN & DETAIL**

WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
PREGONOFF & MATHEO STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
190 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-824-8664

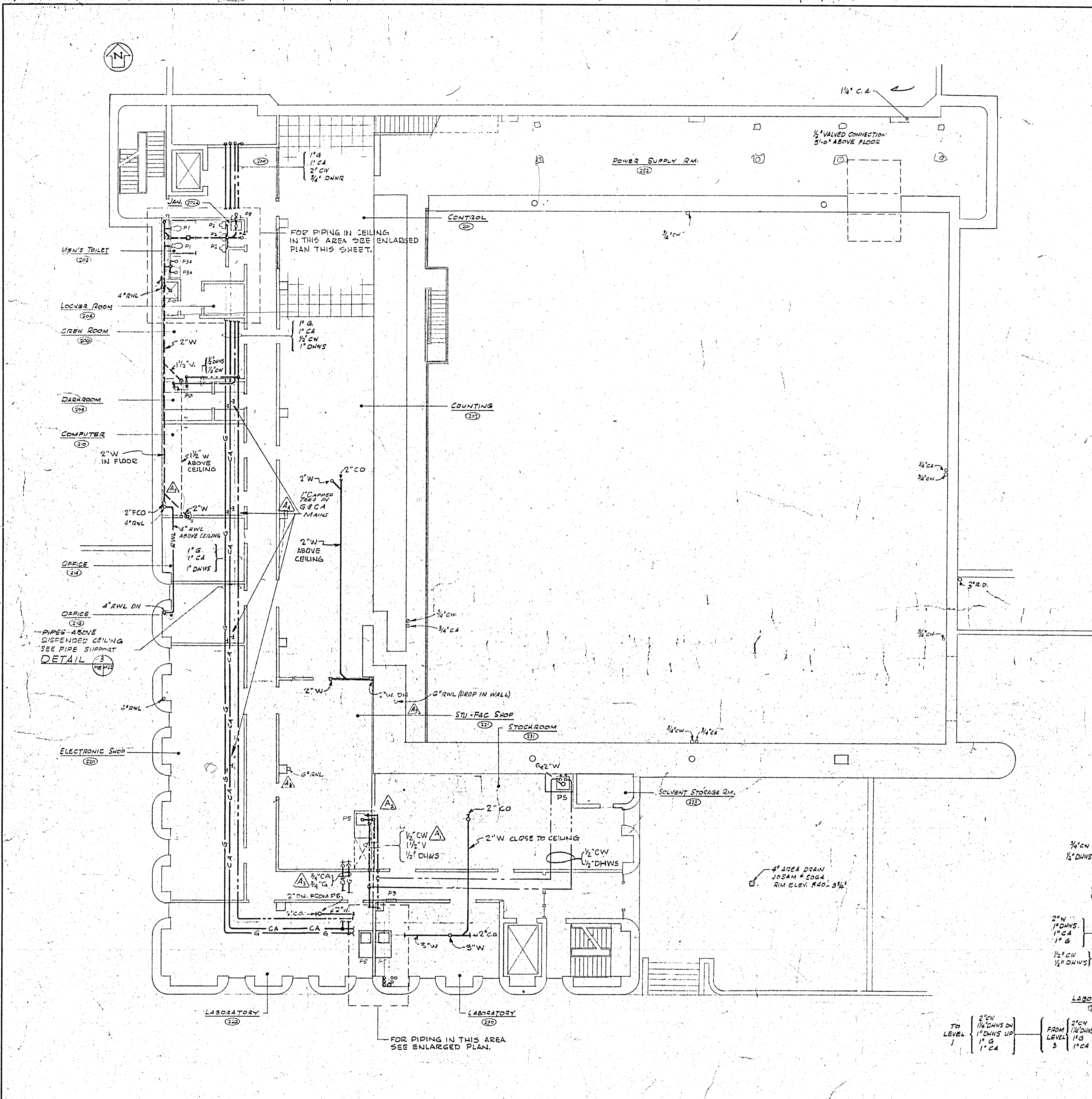
GENERAL NOTES

- 3/4\"/>
- FLOOR DRAINS & TRENCH DRAINS CONNECTED TO STORM DRAINS SHALL NOT BE FITTED WITH TRAPS.
- INSTALL SHOCK ABSORBERS IN HOT & COLD WATER LINES ADJACENT TO EACH FIXTURE OR GROUP OF FIXTURES AS RECOMMENDED BY MANUFACTURER TO PREVENT WATER HAMMER. THE SHOCK ABSORBERS SHOULD BE LOCATED ABOVE THE CEILING SO AS TO BE READILY ACCESSIBLE.
- EXACT LOCATION OF ALL PLUMBING FIXTURES SHALL BE GOVERNED BY THE ARCHITECTURAL DRAWINGS.

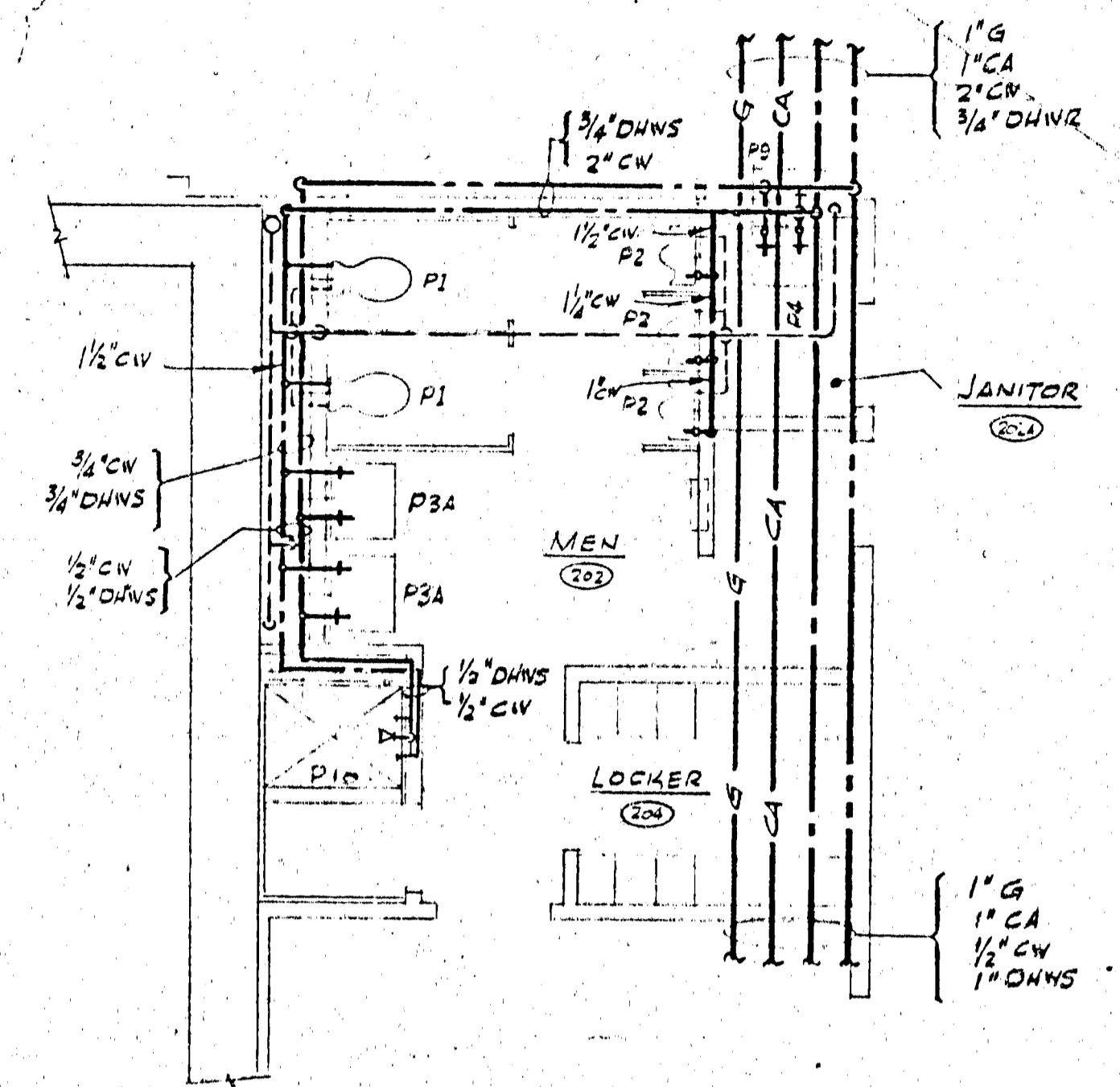
LEVEL #1
SCALE 1/4" = 1'-0"



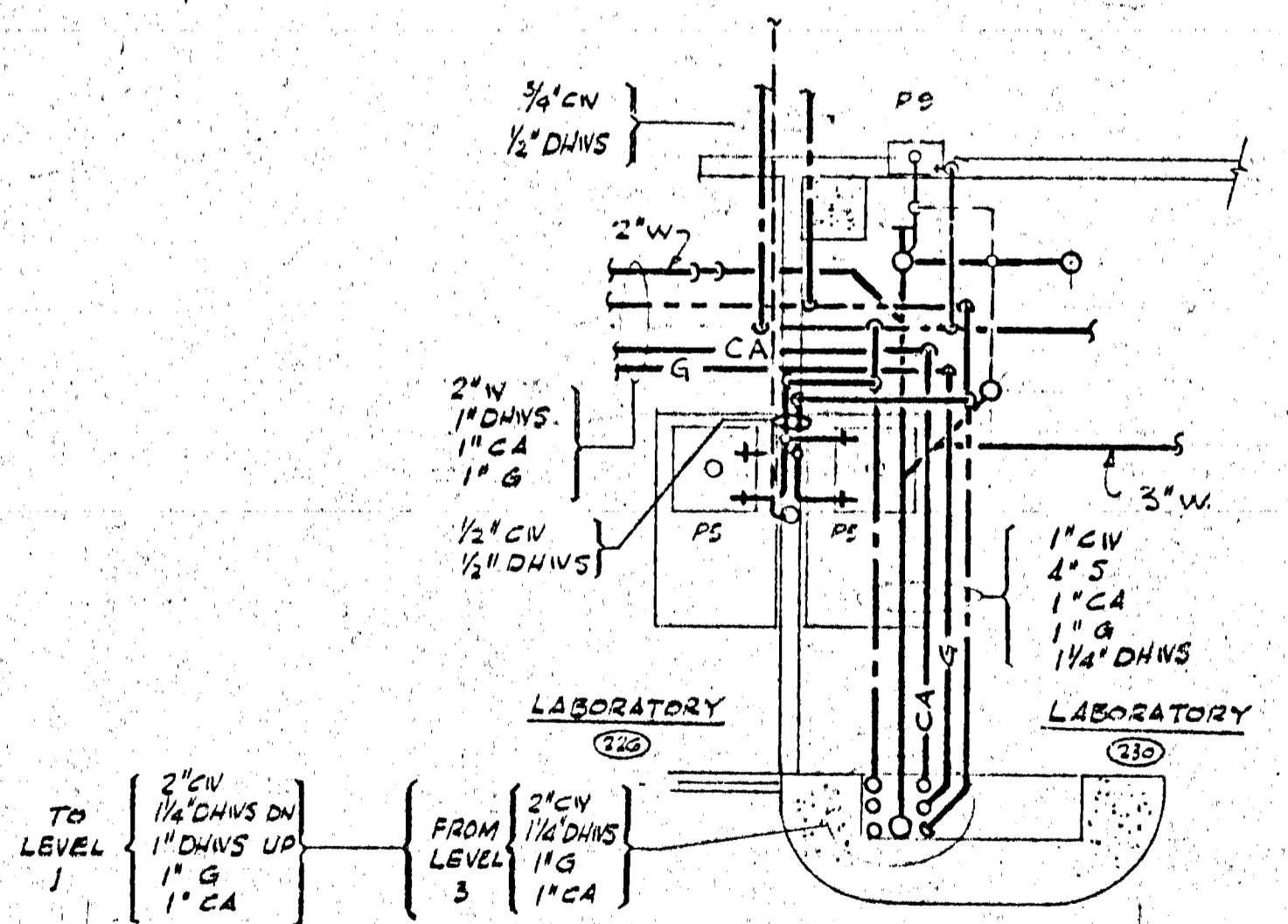
APPROVED FOR CONSTRUCTION



LEVEL #2
SCALE 1/8" = 1'-0"



TOILET AREA
PARTIAL PLAN
SCALE 1/4" = 1'-0"

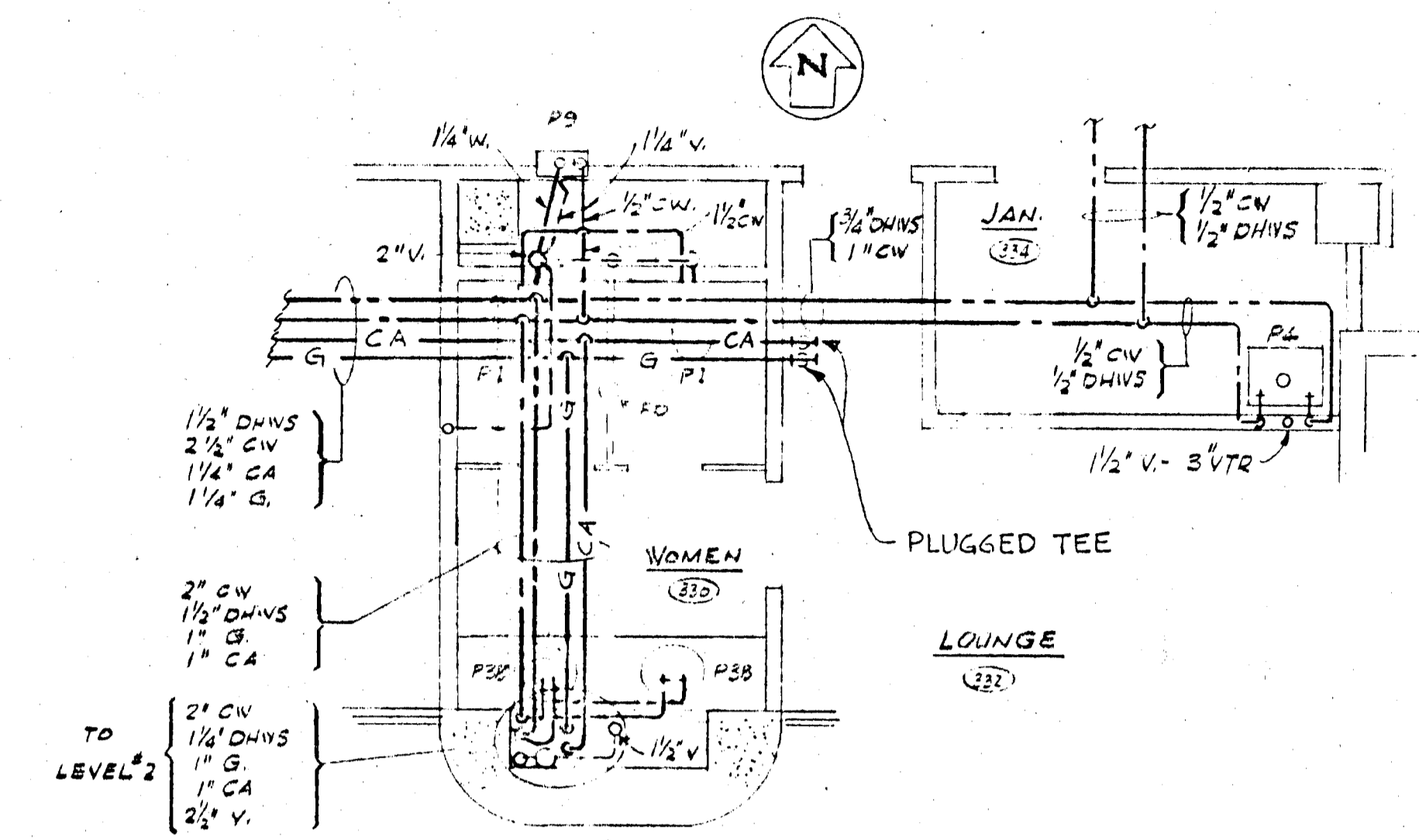
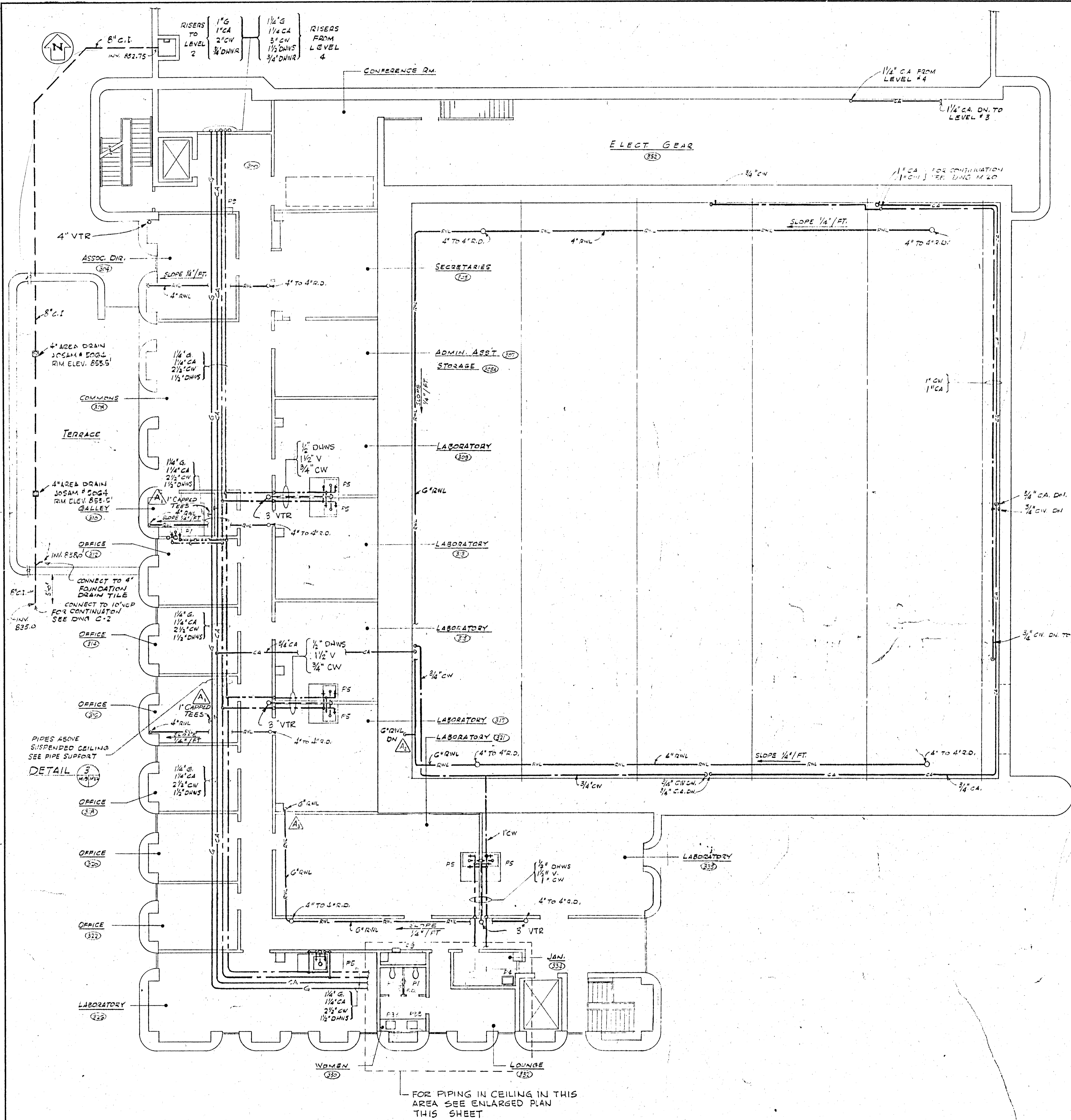


PIPE CHASE AREA
ENLARGED PLAN
SCALE 1/4" = 1'-0"

NOTE
FOR PLUMBING FIXTURE SCHEDULE AND LEGEND REFER TO DWG. 117.

RELOCATED R/WL DEEP FLEDED 1/4" RIGID PIPE, RM 210 1/4" RIGID R/WL IN STU. FAC. 500-221. REMOVED 6" ENL INTO WALL. SHADDED 1" CAPPED TEES, CORRIDORE SHADDED 3/4" CA & 3/4" G BODY 08-221 UNCALCULATED PS PASSOL PIPING. 11/MS 34: RM 231		5-23-66	WMB
LTR	REVISIONS	DATE	CHK'D BY
			APP'D
IO GEV CORNELL SYNCHROTRON LABORATORY CORNELL UNIVERSITY ITHACA NEW YORK			
PLUMBING & LABORATORY SERVICES LEVEL #2 PLAN & DETAILS			
WILLIAM M. BROBECK AND ASSOCIATES IAN MACKINLAY, AIA ARCHITECT PREGNOFF & MATHEU STRUCTURAL ENGR. JACOBS ASSOCIATES CONSTRUCTION ENGR. 750 GILMAN ST. BERKELEY, CALIF. 94710 TELEPHONE 415 - 524 - 8664			
DR. ROESSL	CHIEF ENGINEER	SCALE	NOTED
RELEASED	APPROVED	SHEET	OF
J.H. [Signature]	LAB NUCLEAR STUDIES	64	102
W.M.B. [Signature]	DATE JUN 15, 1966	DRAWING NO.	MIS
		DATE JUN 15, 1966	WMB & NO. 111.5
APPROVED FOR CONSTRUCTION			





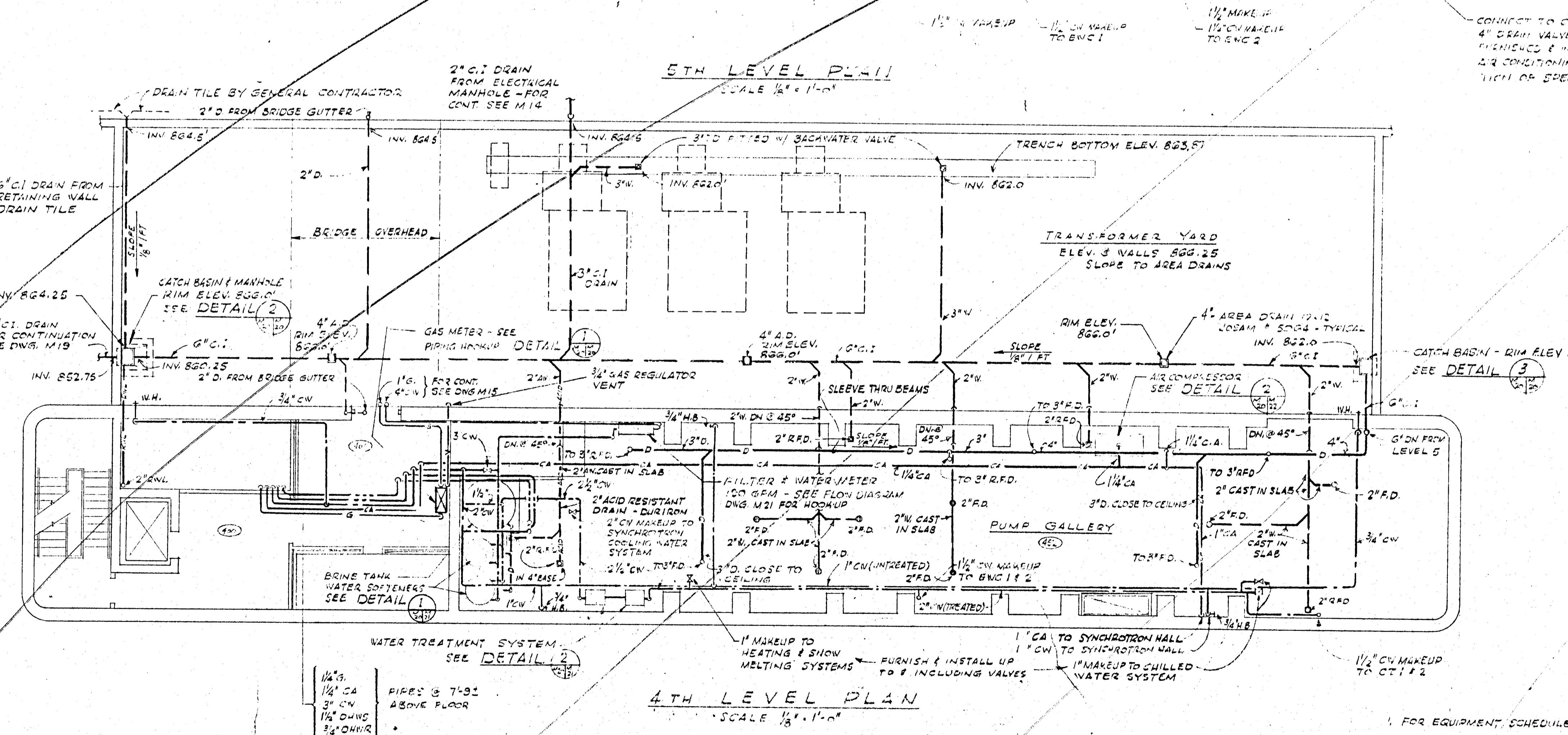
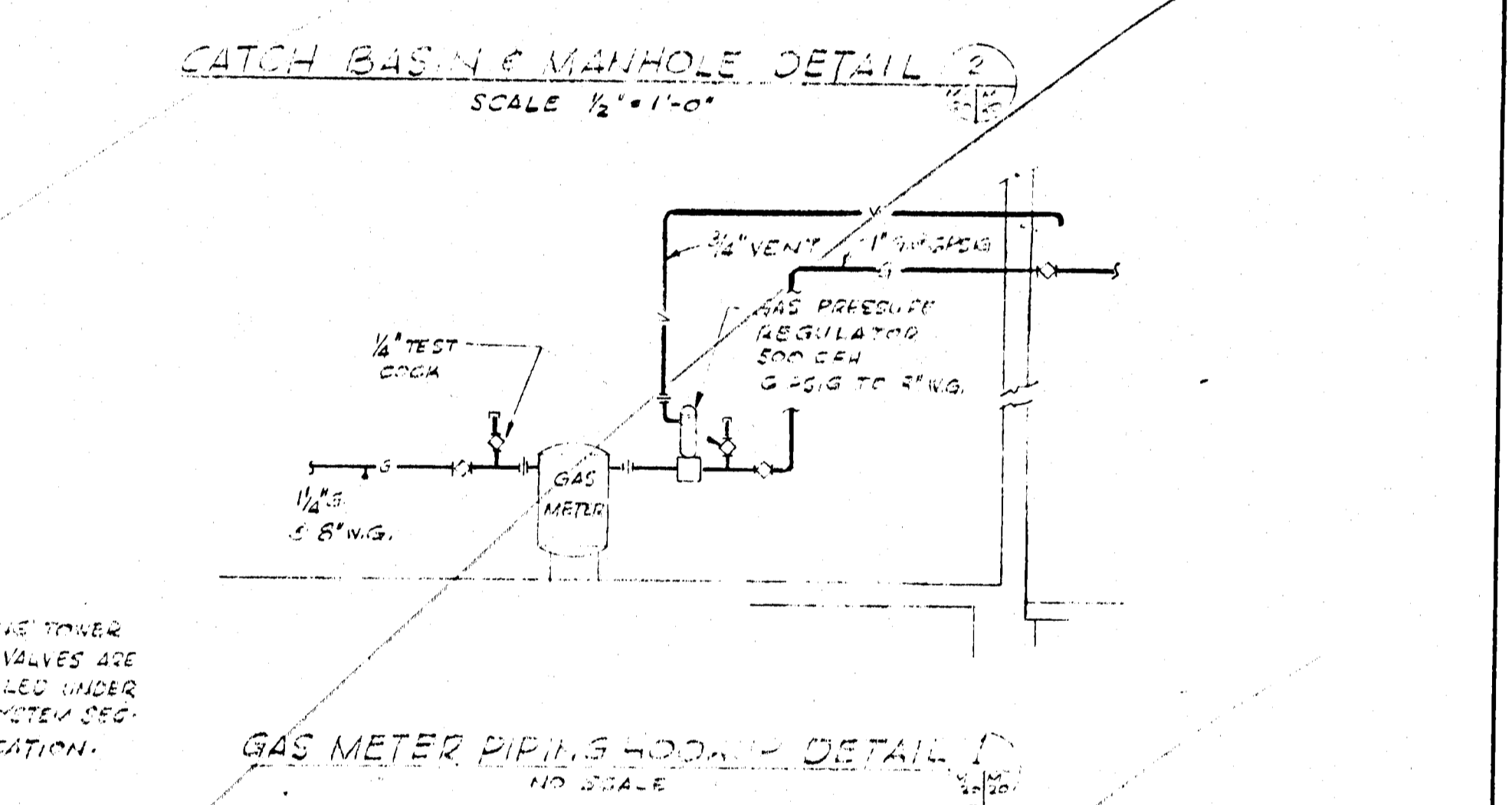
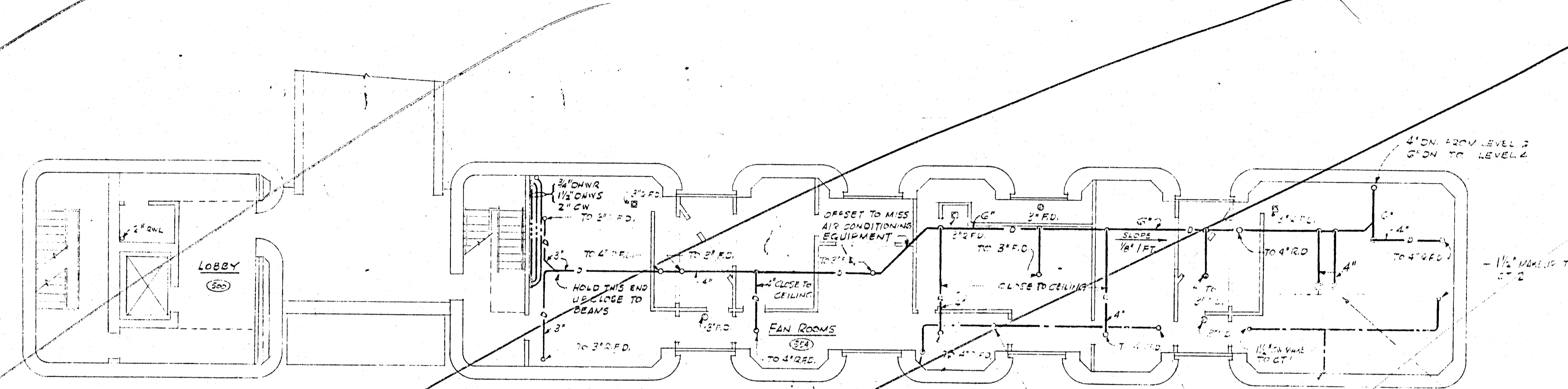
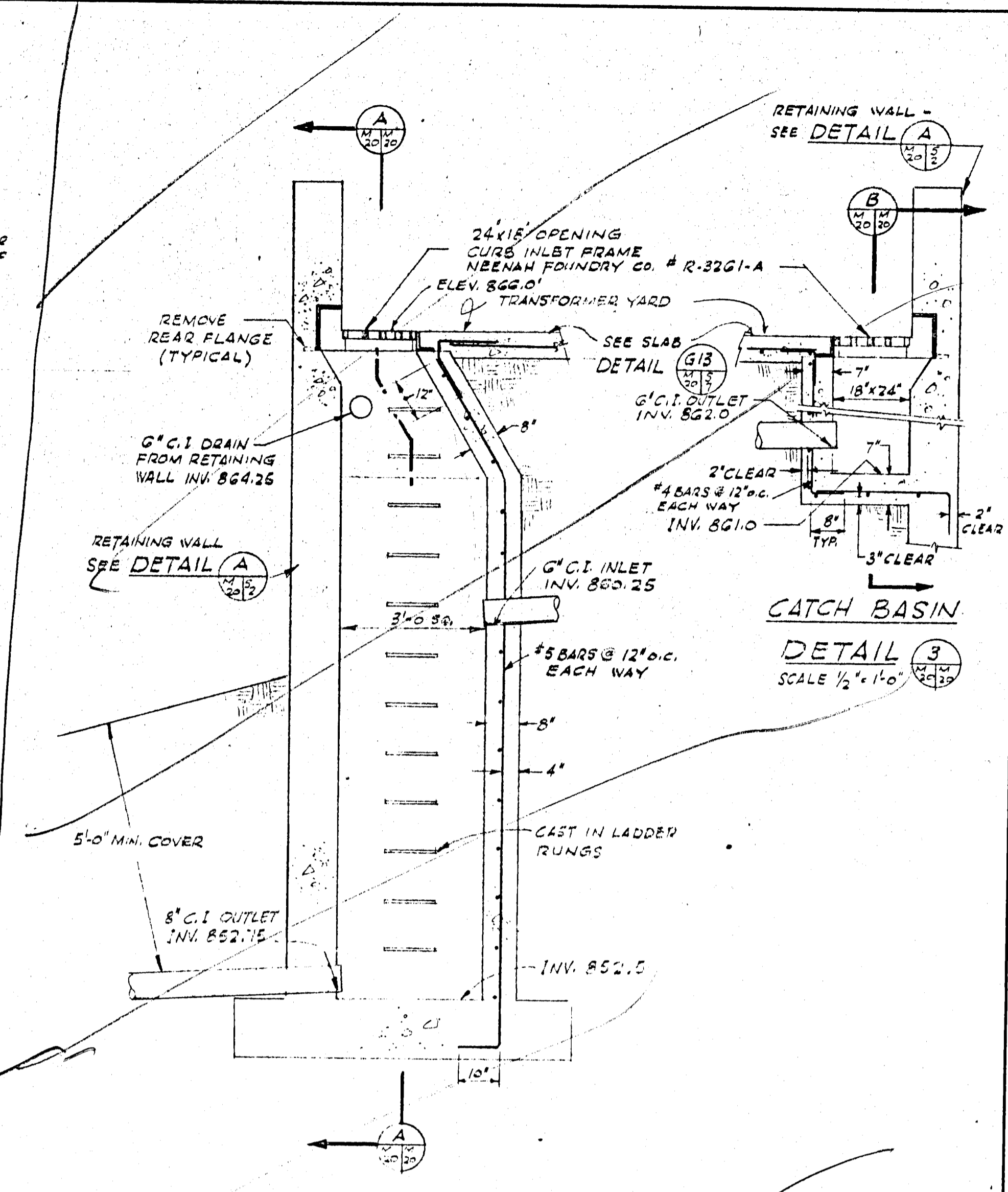
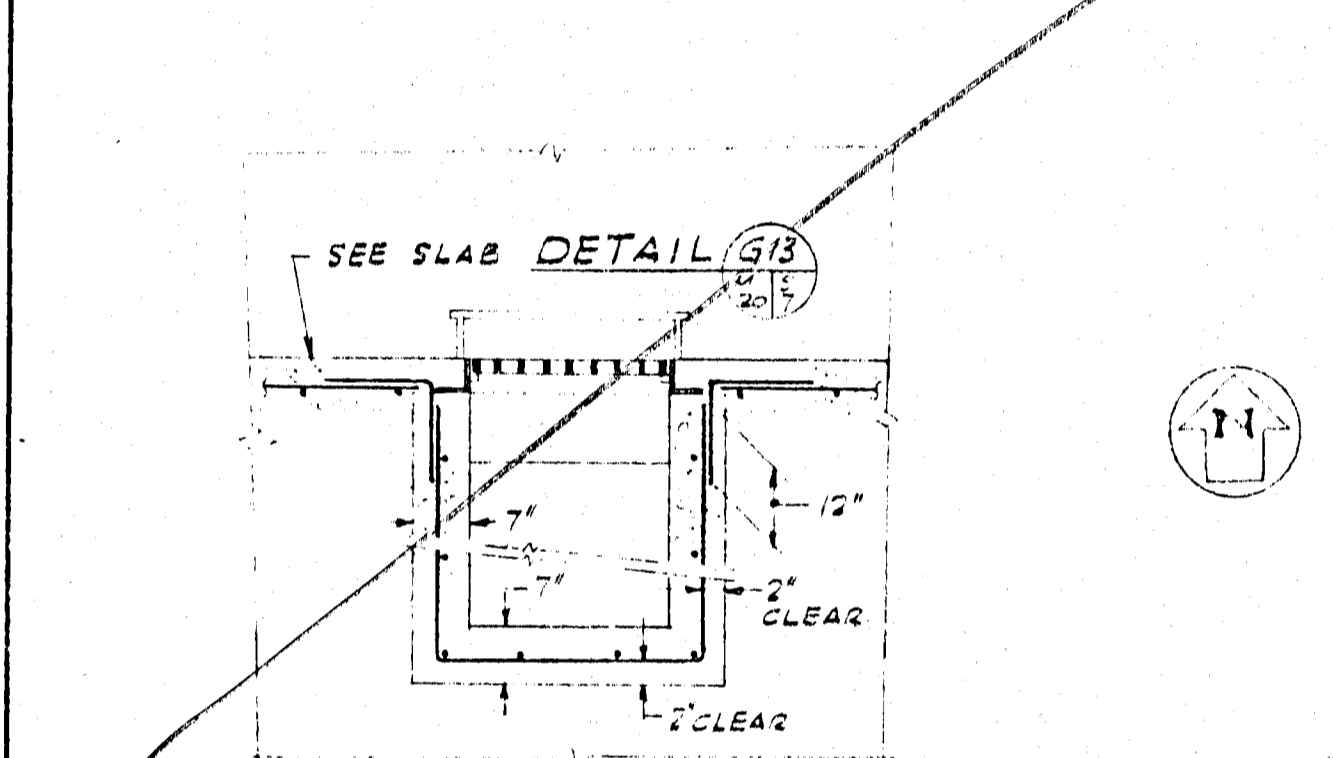
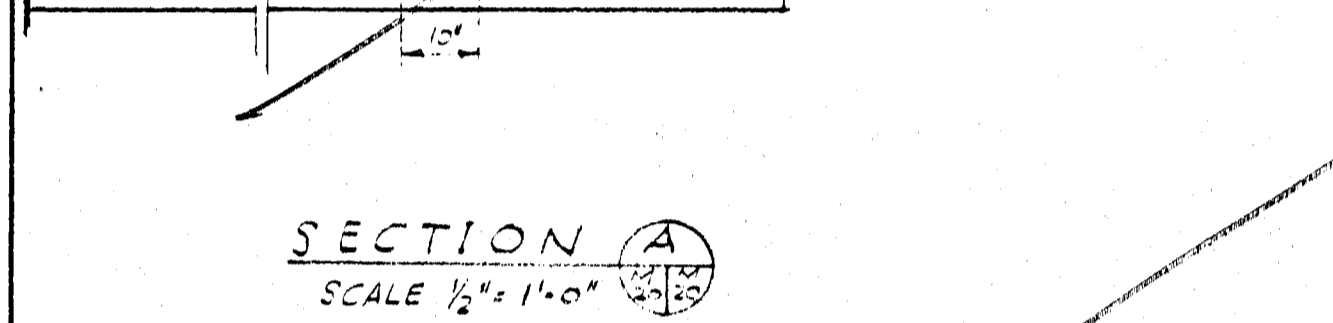
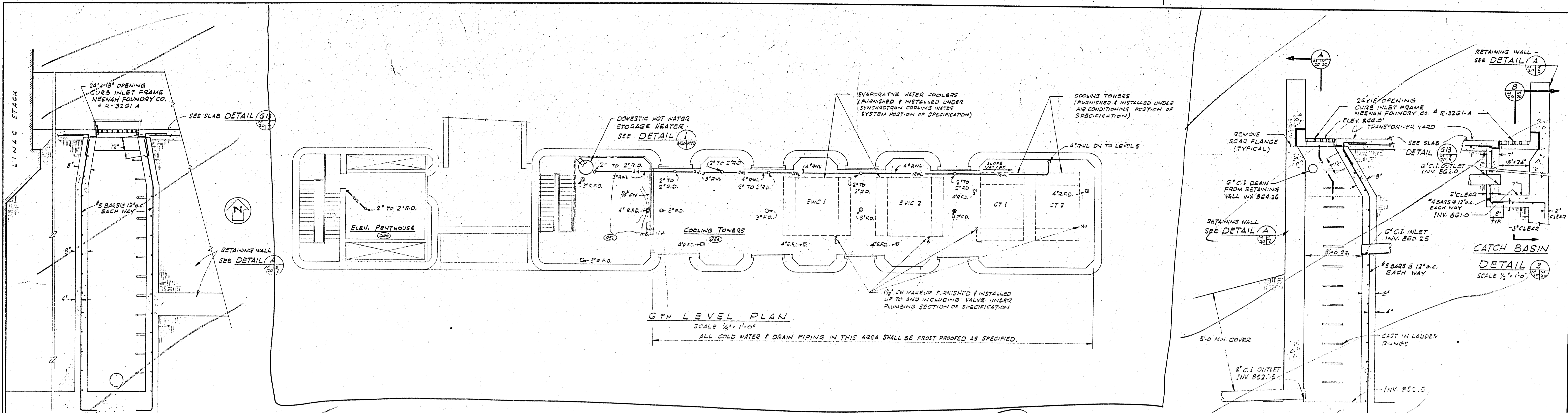
TOILET AREA
PARTIAL PLAN
SCALE 1/4" = 1'-0"

LEVEL #3
SCALE 1/8" = 1'-0"

NOTE
1. FOR PLUMBING FIXTURE SCHEDULE AND LEGEND REFER TO DWG. M-17
2. ALL DRAIN PIPING SHALL BE GALVANIZED SCHEDULE 40 PIPE.

A JARDED / CAPLED TELLING IN 4" MAINS. MOVE ENL INTO WALL. WOULD ENL OUT OF PARTITION		5-22-80 DATE BT	GFM CHKD APPD
LTR	REVISIONS	DATE	CHKD APPD
IO GEV CORNELL SYNCHROTRON LABORATORY CORNELL UNIVERSITY ITHACA NEW YORK			
PLUMBING & LABORATORY SERVICES LEVEL #3 PLAN & DETAILS			
WILLIAM M. BROBECK AND ASSOCIATES IAN MACKINLAY, AIA ARCHITECT PREGNOFF & MATHEU STRUCTURAL ENGR. JACOBS ASSOCIATES CONSTRUCTION ENGR. 950 GILMAN ST. BERKELEY, CALIF. 94710 TELEPHONE 415 - 824 - 8664			
DR. GREGOR	CHKD. GREGOR	SUPP. MATH	SCALE
RELEASED	APPROVED		NOTED
J.H. Clive		LAB NUCLEAR STUDIES	SHEET 102
		V.P.-BUSINESS	DRAWING NO.
W.M. Brobeck			M19
DATE 12/15/80	DATE JAN 15/81	WMB & NO. 111.5	
APPROVED FOR CONSTRUCTION			

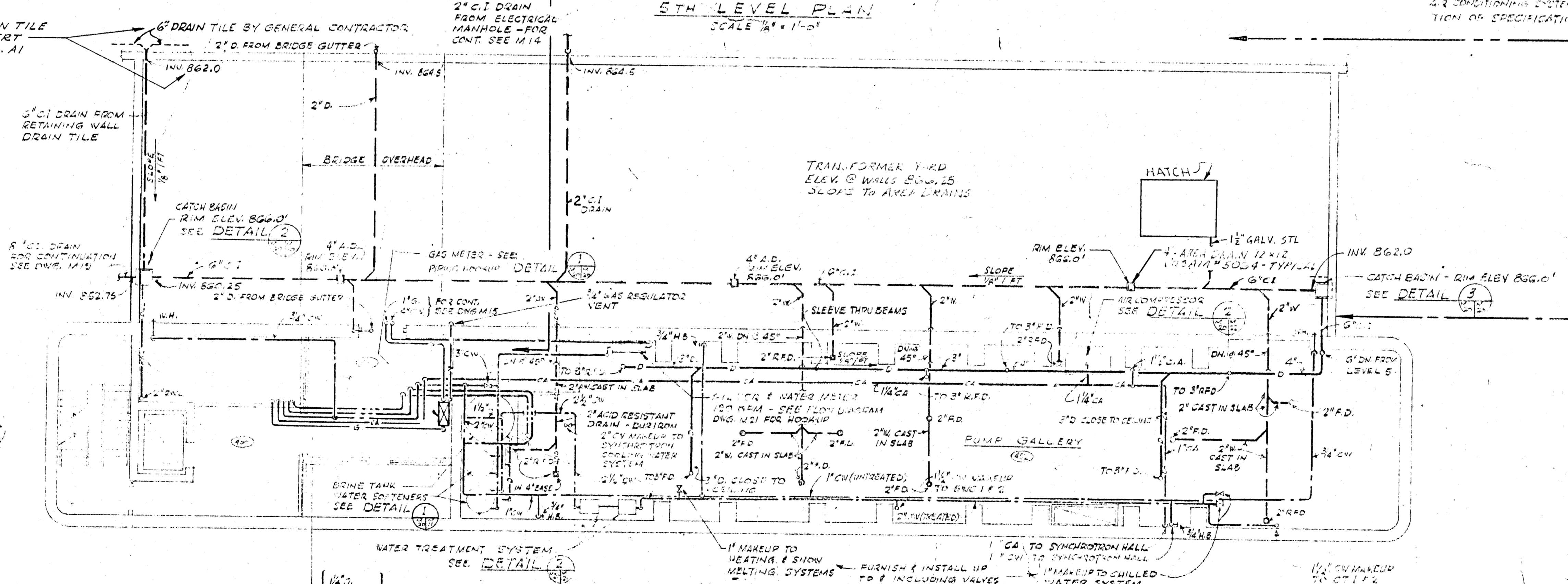
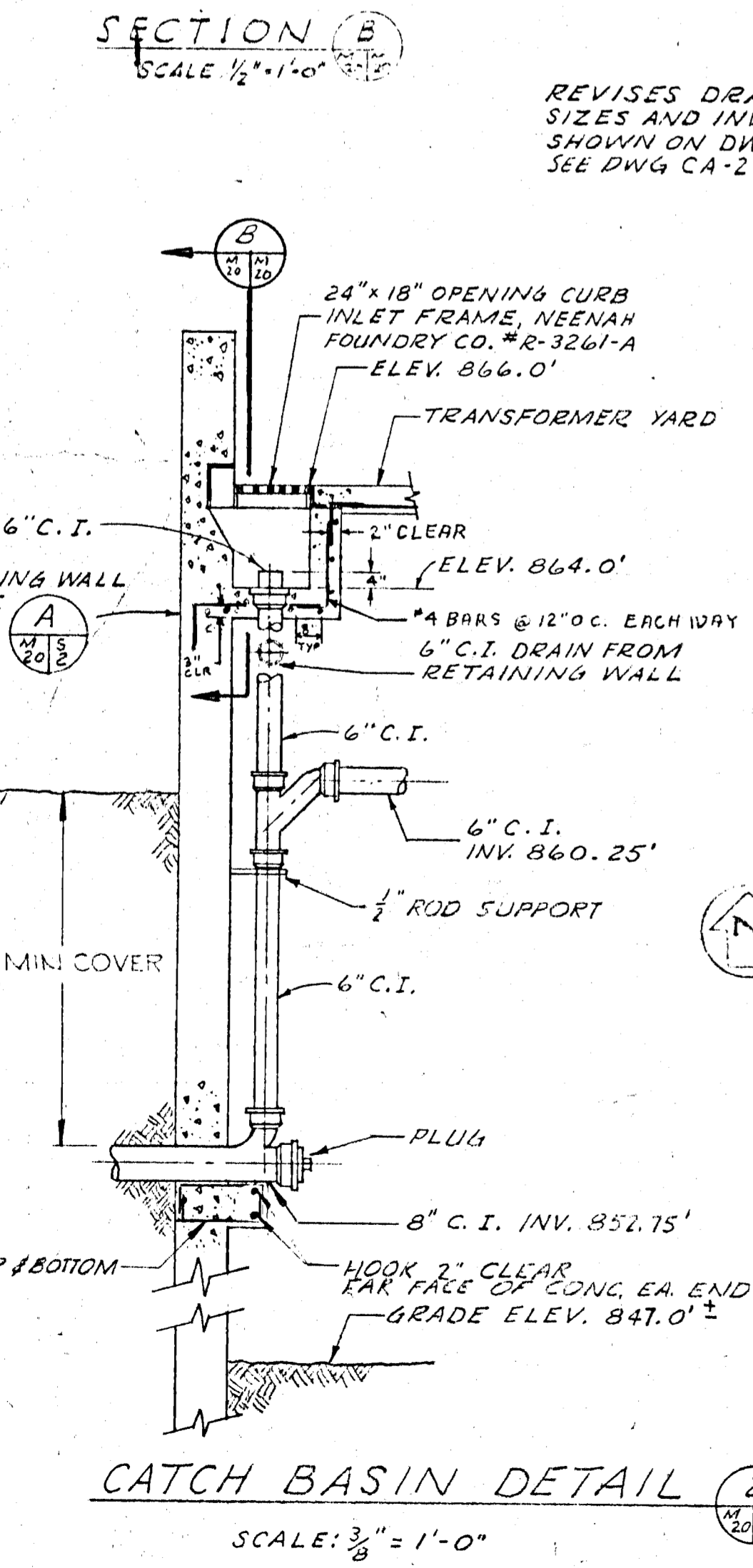
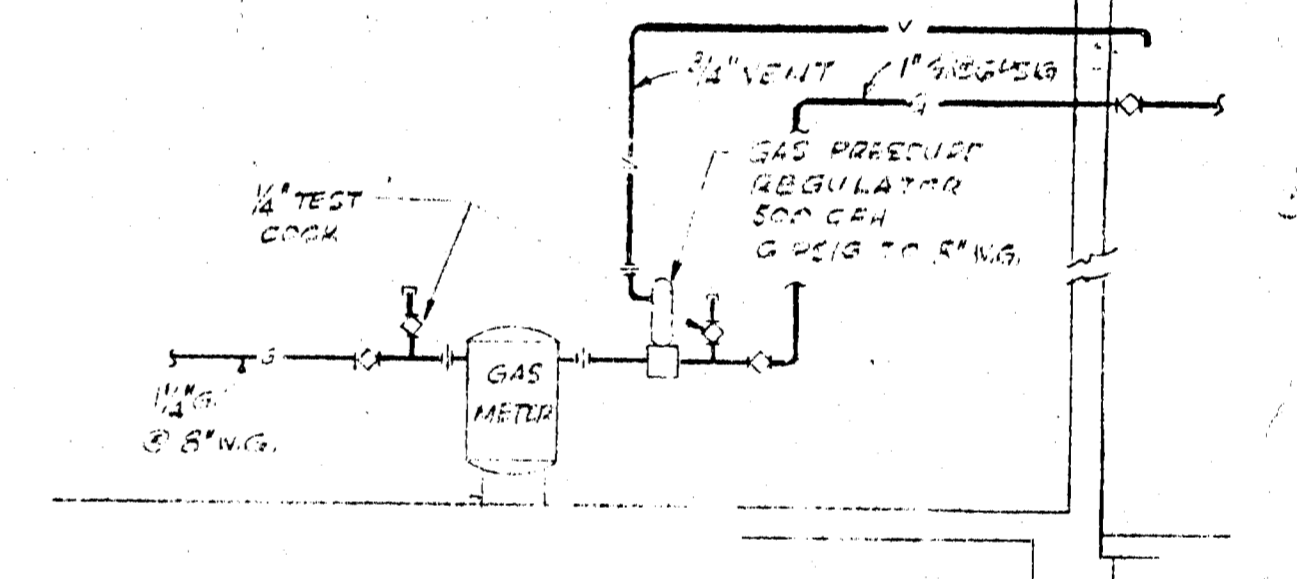
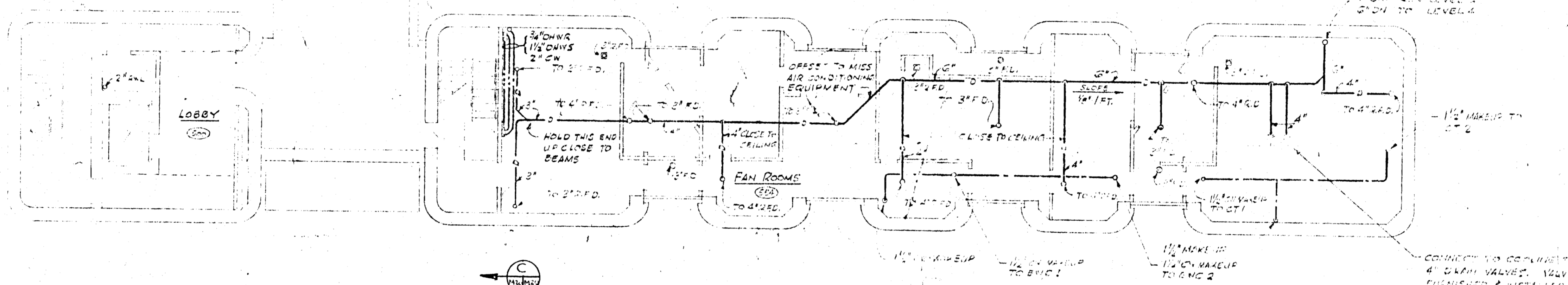
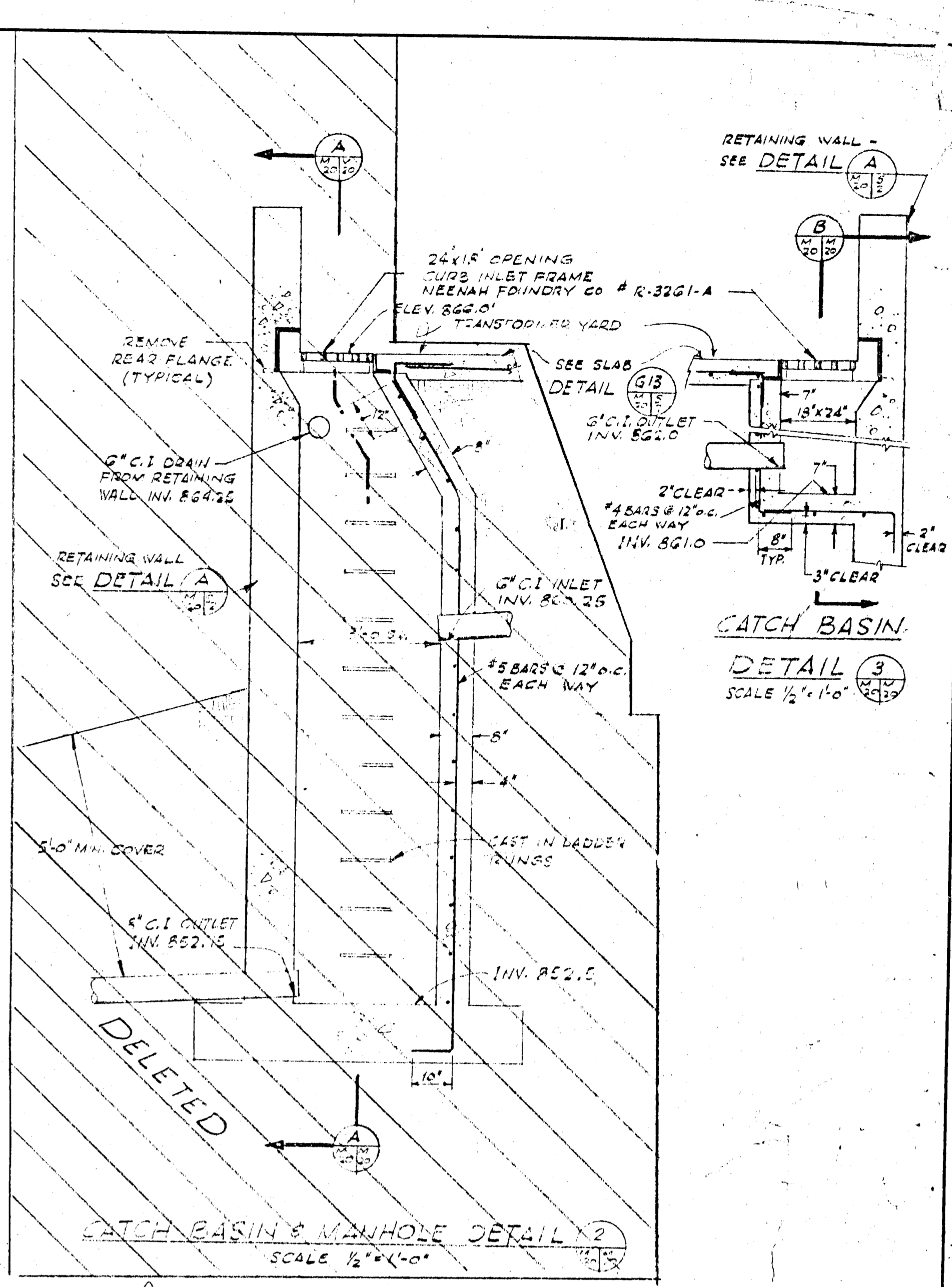
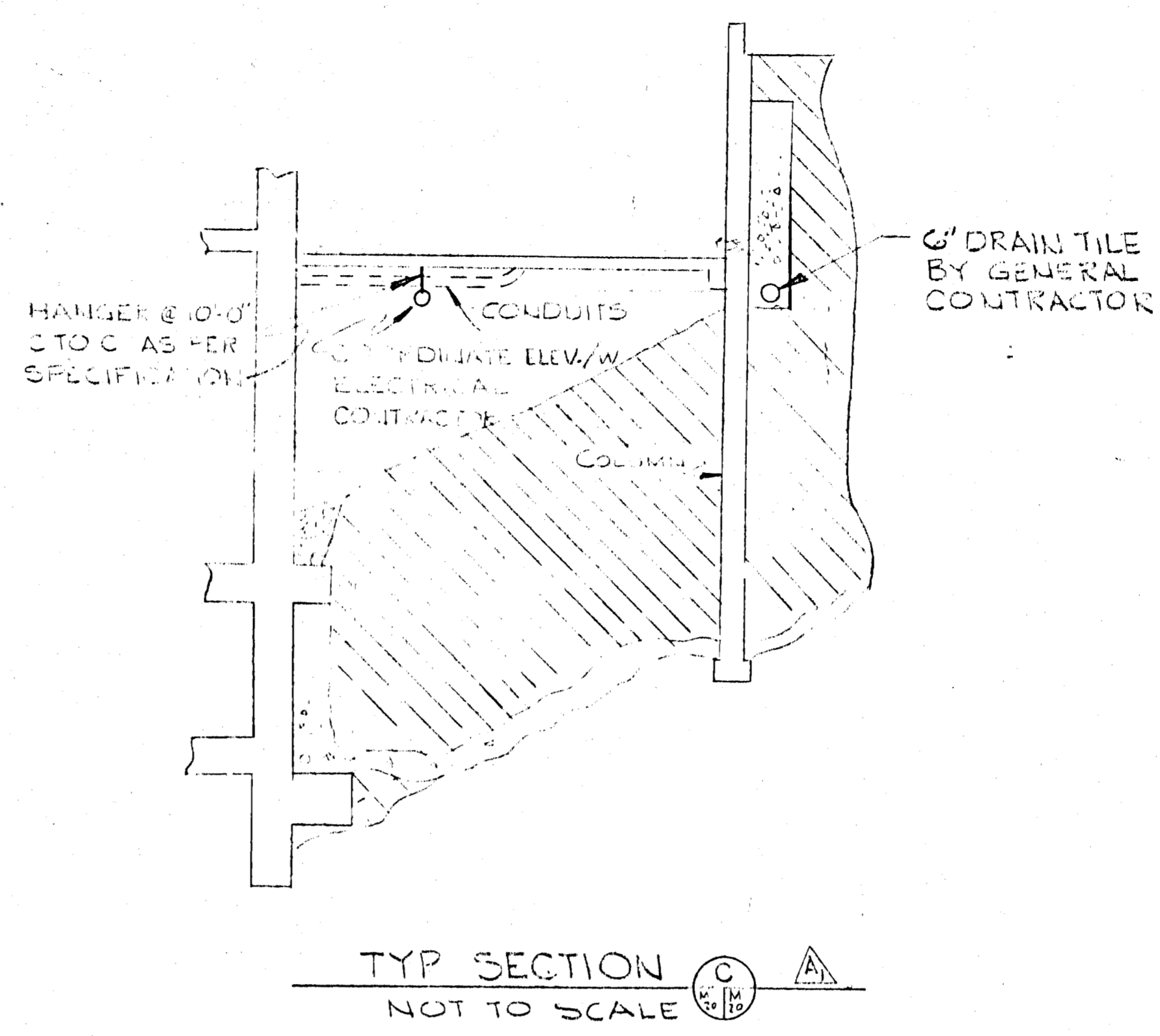
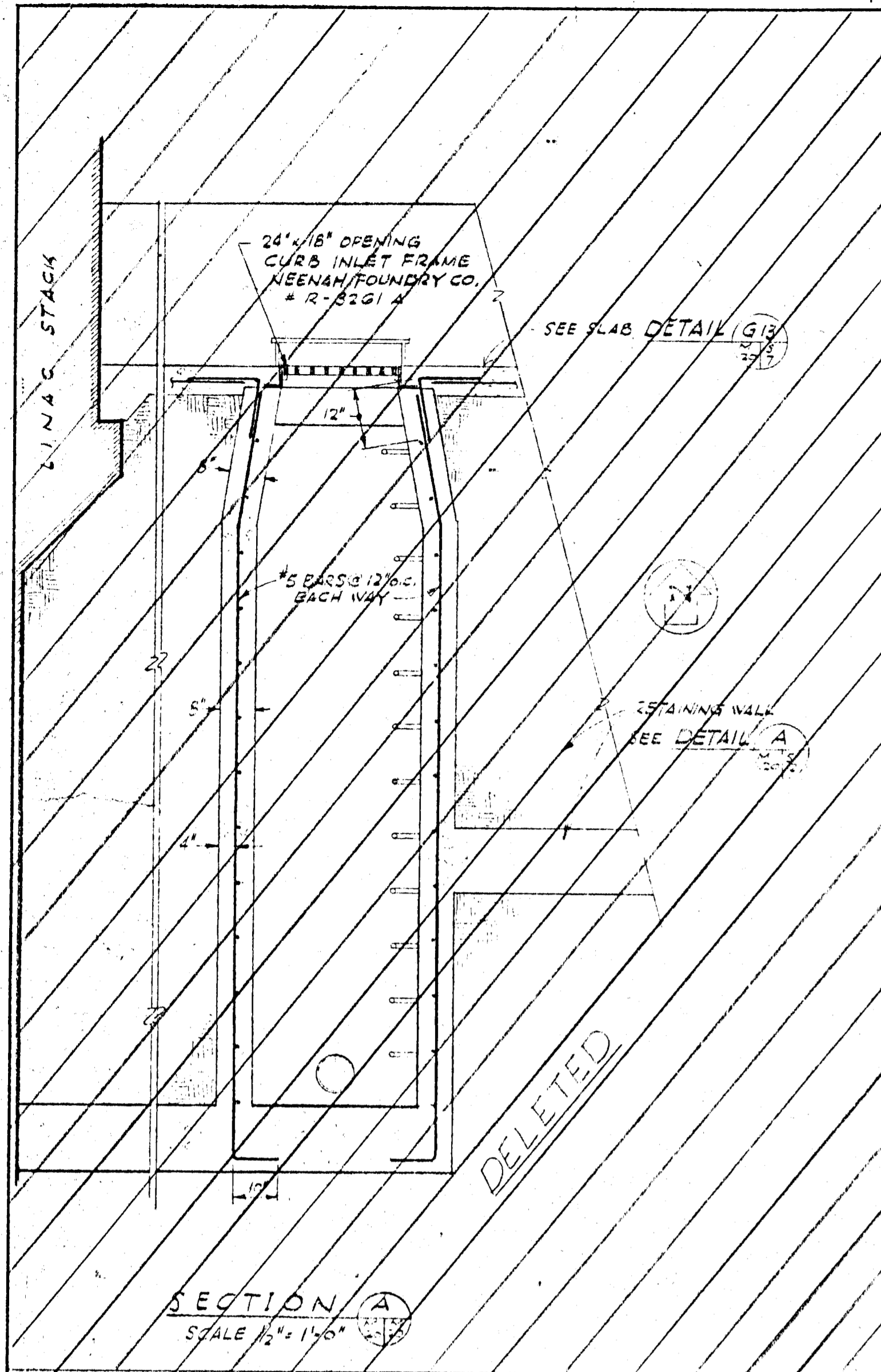




APPROVED FOR CONSTRUCTION

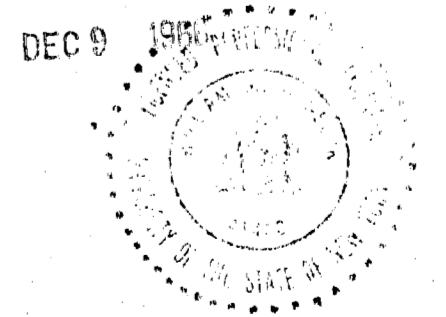
DATE	CHKD	APPD
REVISIONS	BY	APPD
IO GEV CORNELL SYNCHROTRON LABORATORY		
CORNELL UNIVERSITY		ITHACA, NEW YORK
PLUMBING & LABORATORY SERVICES LEVELS 4, 5 & 6 PLANS		
WILLIAM M. BROBECK AND ASSOCIATES		
IAN MACKINLAY, AIA	ARCHITECT	
PREGNOFF & MATHEU	STRUCTURAL ENGR.	
JACOBS ASSOCIATES	CONSTRUCTION ENGR.	
950 GILMAN ST.	BERKELEY, CALIF. 94710	
TELEPHONE	415-524-8664	
DR. NO. 222	CHKD. <i>(Signature)</i>	SUPV. <i>(Signature)</i>
RELEASED	APPROVED	SCALE
<i>(Signature)</i>	LAB NUCLEAR STUDIES	SHEET 65 OF 102
DATE NOV. 15, 1967	VP. BUSINESS	DRAWING NO. M 1013
	DATE JAN. 15, 1968	WMB & A NO. 1115

- NOTES**
- FOR EQUIPMENT, SCHEDULE AND LEGEND REFER TO DWG. M.17.
 - ALL DRAIN PIPING SHALL BE GALVANIZED SCHEDULE 40 PIPE.
 - FLOOR DRAINS CONNECTED TO STORM DRAIN SYSTEM SHALL NOT BE FITTED WITH TRAPS.
 - EXACT LOCATION OF FLOOR DRAINS SHALL BE DETERMINED BY MECHANICAL DEPARTMENT.



REVISED AREA DETAILS NOT NOTED SAME AS ORIGINAL DWGS & REVISED DETAILS TO DATE T.H.R.

APPROVED FOR CONSTRUCTION



- NOTES
- FOR EQUIPMENT SCHEDULES AND LEGEND REFER TO DWG. M-1.
 - ALL DRAIN PIPES SHALL BE GALVANIZED SCHEDULE 40 PIPE.
 - FLOOR DRAINS CONNECTED TO STORM DRAIN SYSTEM SHALL NOT BE FITTED WITH TRAPS.
 - EXACT LOCATION OF FLOOR DRAINS SHALL BE DETERMINED BY MECHANICAL EQUIPMENT.
 - REMOVED MANHOLE, TRENCH DRAINS AND REVISED INVERT ELEVATIONS IN TRANSFORMER YARD.
 - REVISE LOCATION OF NORTH SOUTH SHOWING LINES SHOWN ON DRAWING TO CLEAR HATCHES COORDINATE WITH ELEC. CONTRACTOR TO PASS BETWEEN ELEC. GEAR, AND EXTEND ALL LOCAL TO N WALL.

APPROVED AND ISSUED FOR CONSTRUCTION

Subject to all conditions of contract plans and specifications and provisions contained in architect's approval noted hereon.

DEC 14 1966

CORNELL UNIVERSITY

1	ADDED NEW DETAILS	SS	T.C.M.
2	DELETED OBSOLETE DETAILS	HW/SL	HW/SL
3	REVISED SOME V.D. PLAN		
4	ADDED NOTES	SSG	

LTR	REVISIONS	DATE	CHKD	APP'D

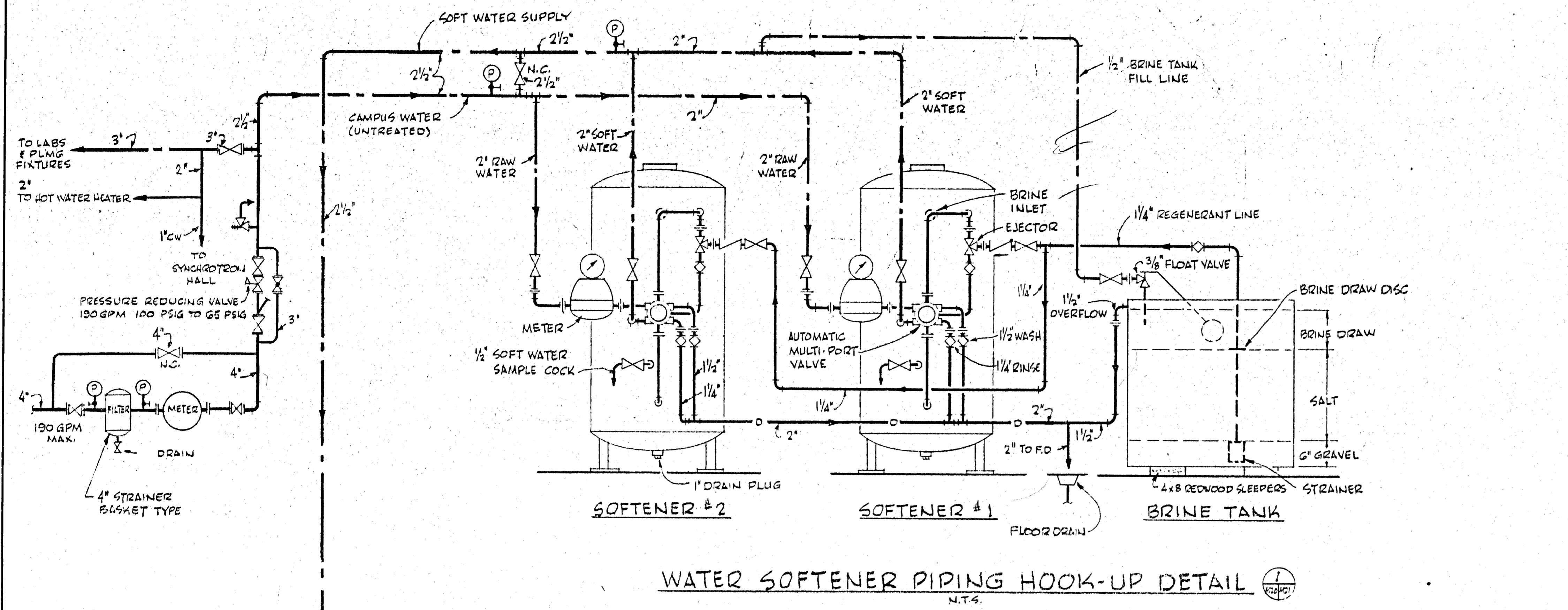
IO GEV CORNELL SYNCHROTRON LABORATORY
CORNELL UNIVERSITY ITHACA, NEW YORK

PLUMBING & LABORATORY SERVICES LEVELS 4, 5 & 6 PLANS

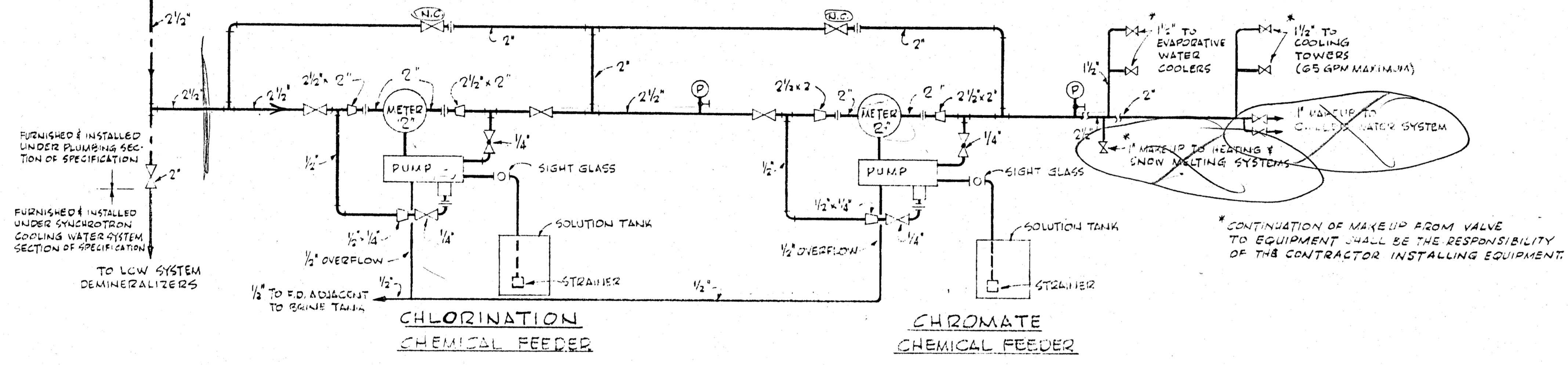
WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
PREGONOFF & MATHEU STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415 - 524 - 8664

DR. 11118	CHKD. W.M. BROBECK	SUPPLY	SCALE
RELEASED	APPROVED	SHEET	OF
T.H. CLARK	LAB NUCLEAR STUDIES	63	102
DATE: NOV. 15, 1966	DATE: JAN. 15, 1966	DRAWING NO.	
		WMB & A NO. 11118	

8 DEC 1966

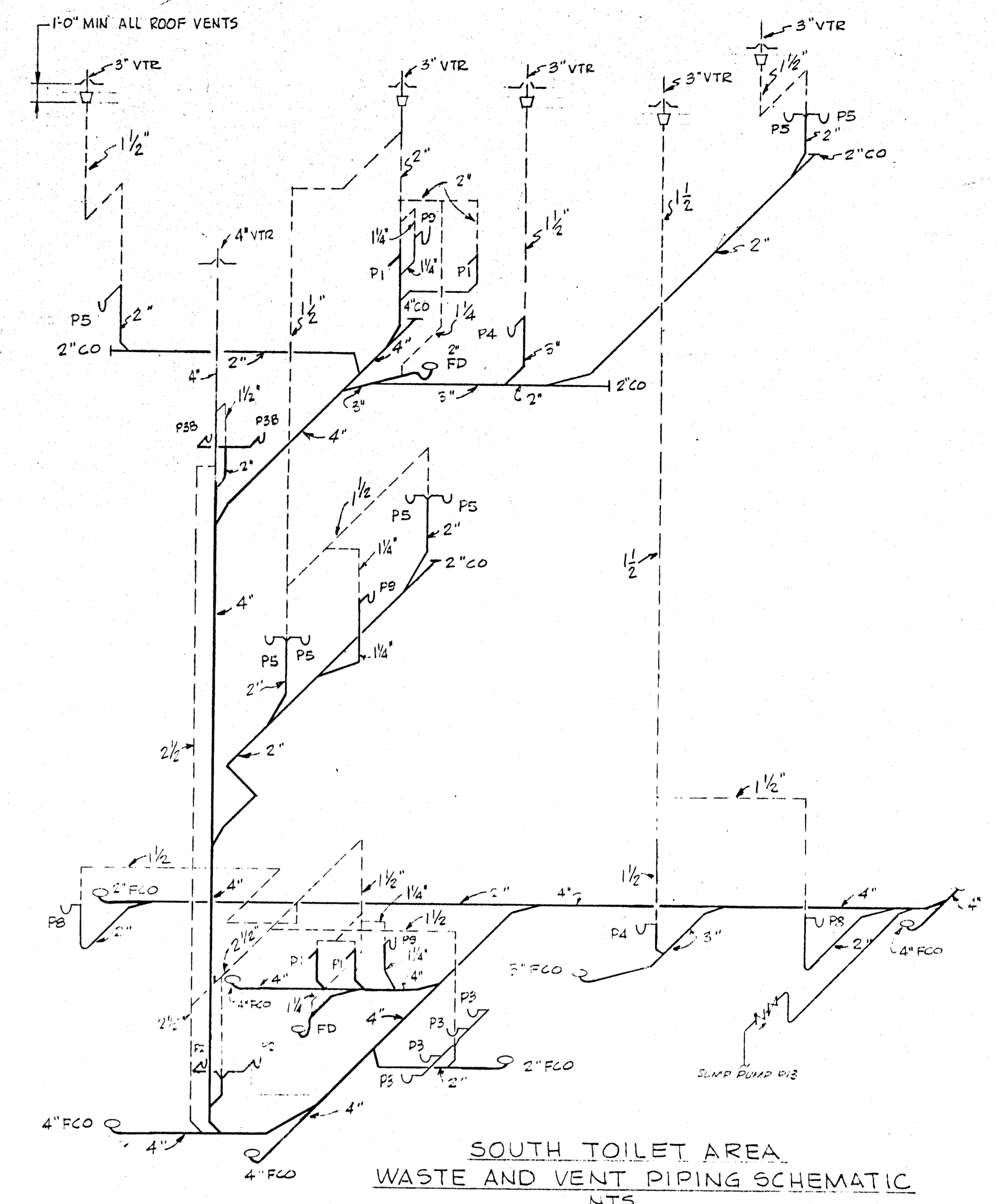


WATER SOFTENER PIPING HOOK-UP DETAIL
N.T.S.

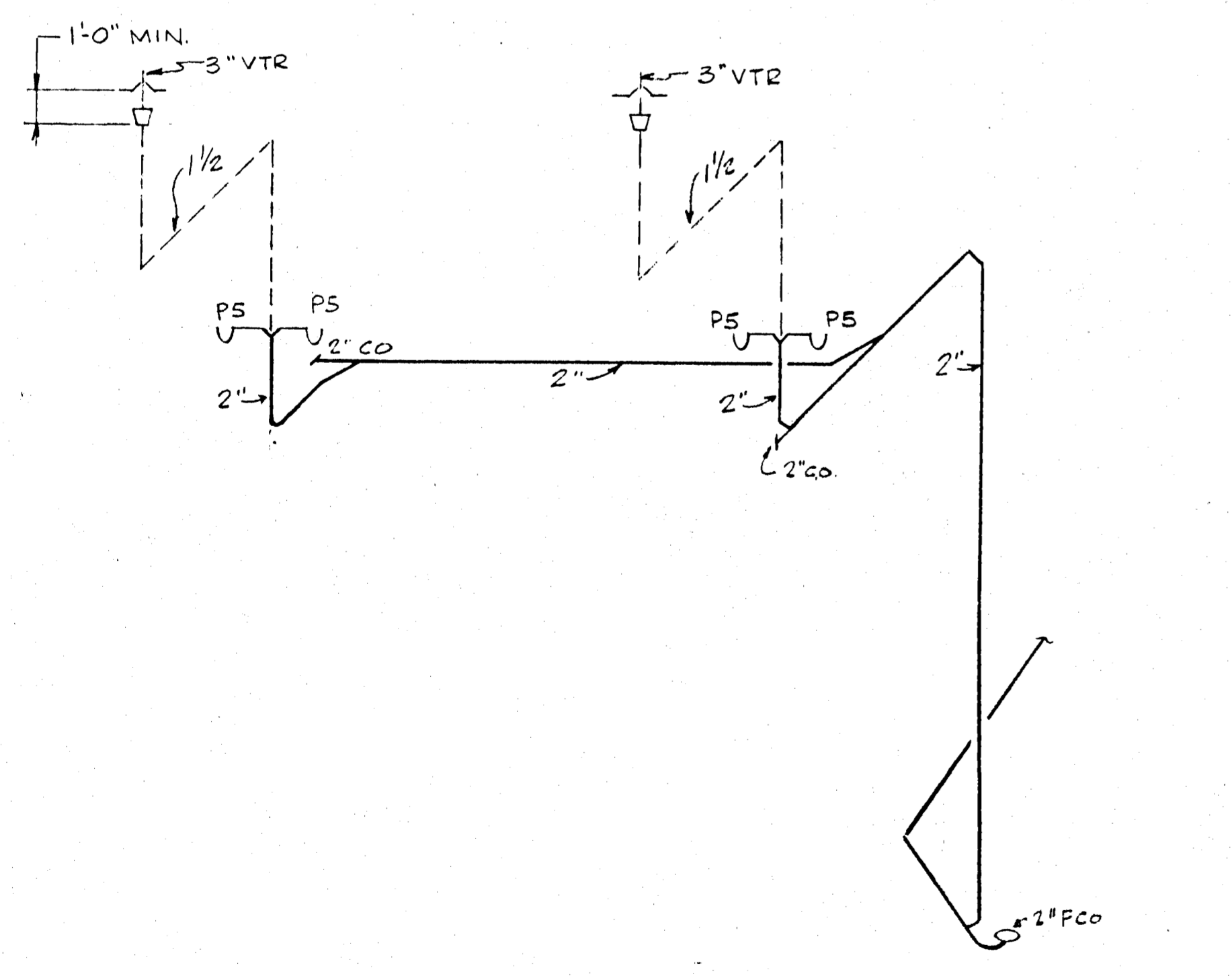


CHEMICAL TREATMENT SYSTEM PIPING HOOK-UP DETAIL
N.T.S.

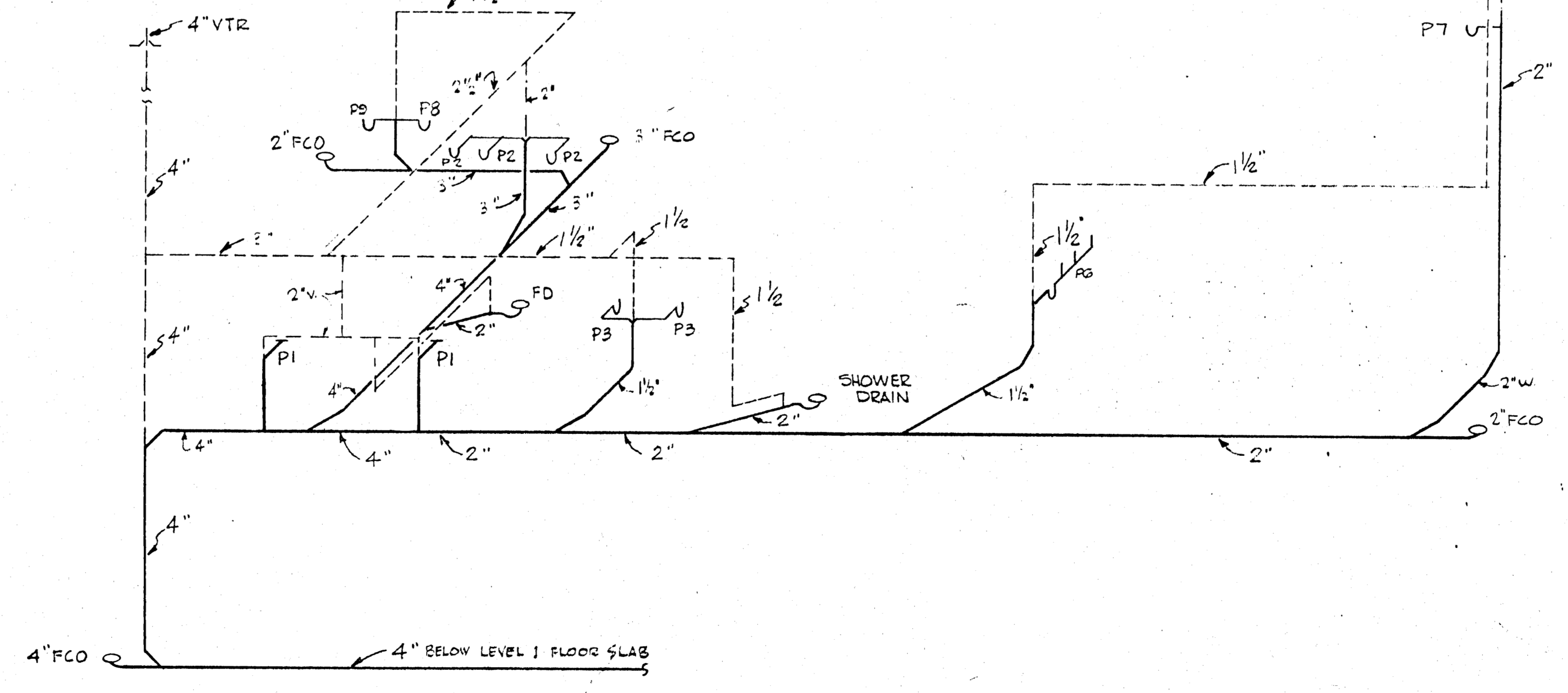
WATER TREATMENT SYSTEM



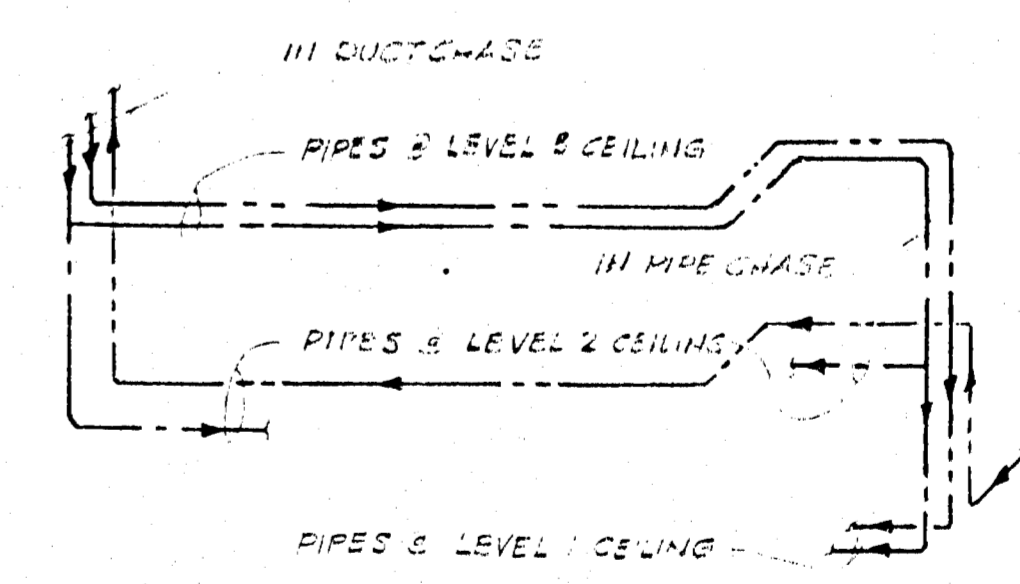
SOUTH TOILET AREA
WASTE AND VENT PIPING SCHEMATIC
N.T.S.



WEST SIDE 2ND FLOOR LAB SINKS
WASTE AND VENT PIPING SCHEMATIC
N.T.S.



WEST TOILET AREA
WASTE AND VENT PIPING SCHEMATIC
N.T.S.

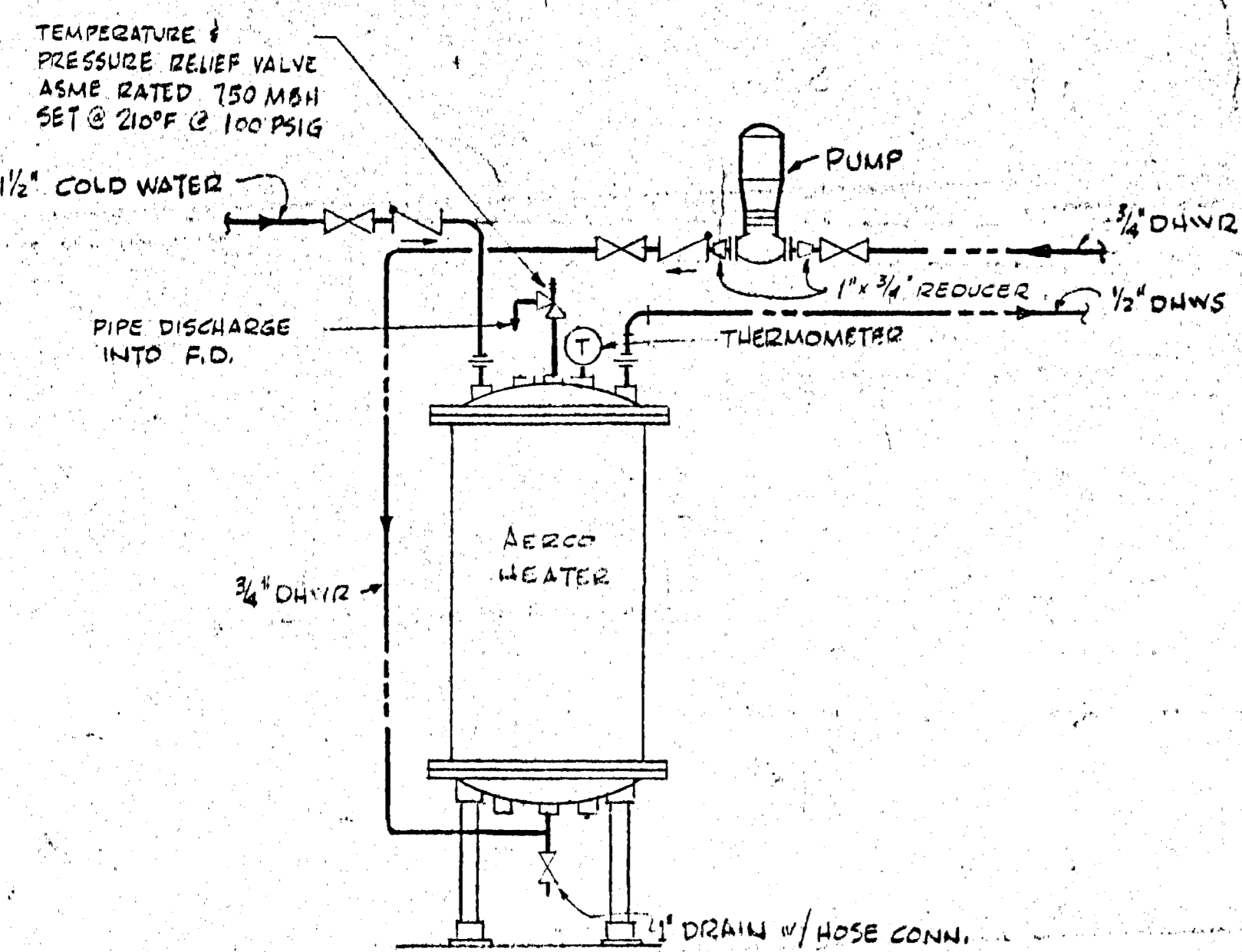


CW, DWWS & DHWR MAIN
PIPING SCHEMATIC

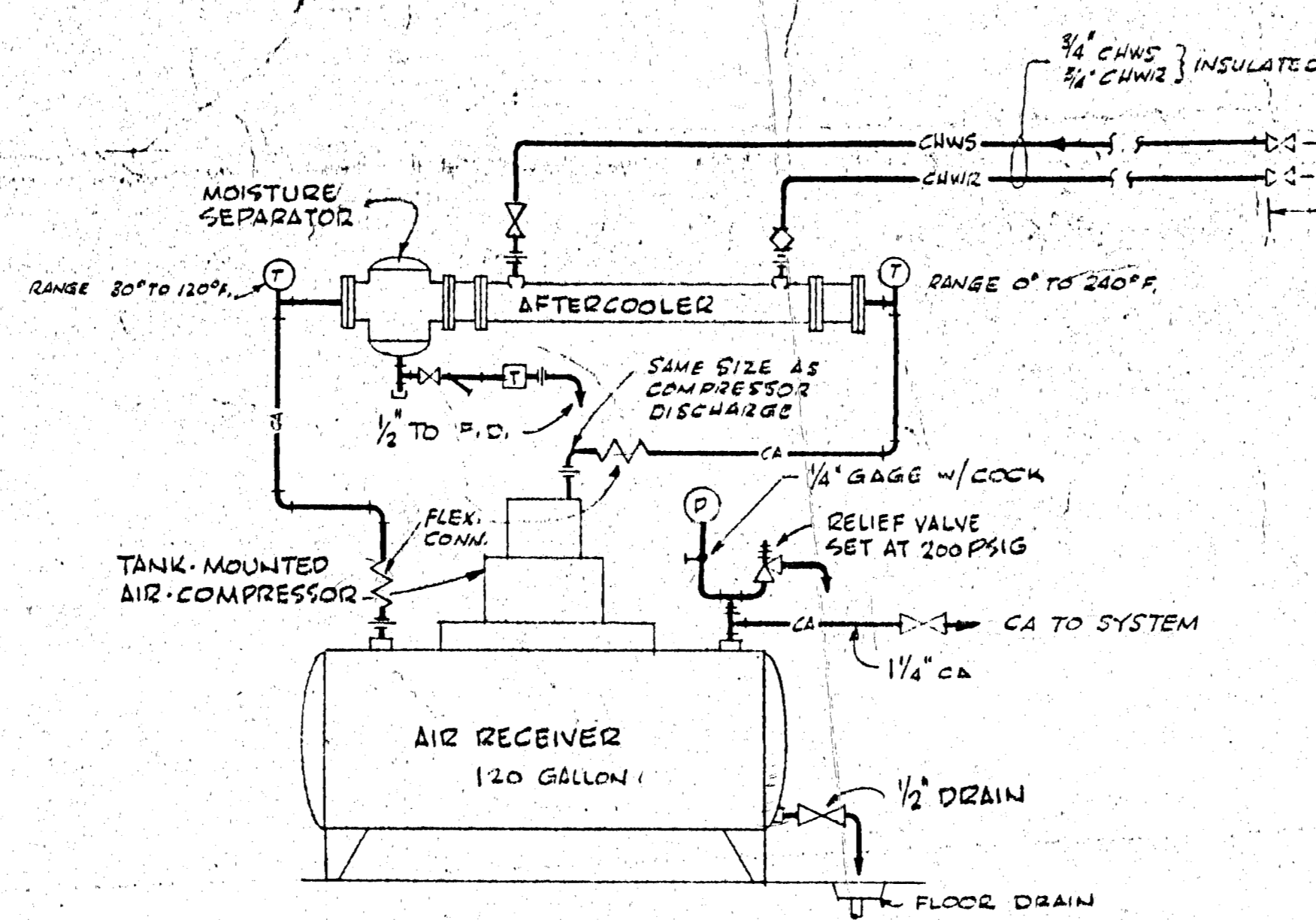
APPROVED FOR
CONSTRUCTION

DATE	BY	CHKD	APPD	APPD
IO GEV CORNELL SYNCHROTRON LABORATORY CORNELL UNIVERSITY ITHACA NEW YORK				
PROJECT NO. 1 LABORATORY SERVICES DETAILS & SCHEMATICS				
WILLIAM M. BROBECK AND ASSOCIATES IAN MACKINLAY, AIA ARCHITECT PREGNOFF & MATHEU STRUCTURAL ENGR. JACOBS ASSOCIATES CONSTRUCTION ENGR. 950 GILMAN ST. BERKELEY, CALIF. 94710 TELEPHONE 415-524-8864				
DR. 120692	CHKD/APPD	SUPV	DATE	SCALE
RELEASED	APPROVED	SHEET	OF	
T.H. Ames	LAB NUCLEAR STUDIES	G7	102	
DATE NOV. 2, 1966	V.P.-BUSINESS	DRAWING NO.		
	DATE JAN 15, 1966	WMB & A NO. 1115		

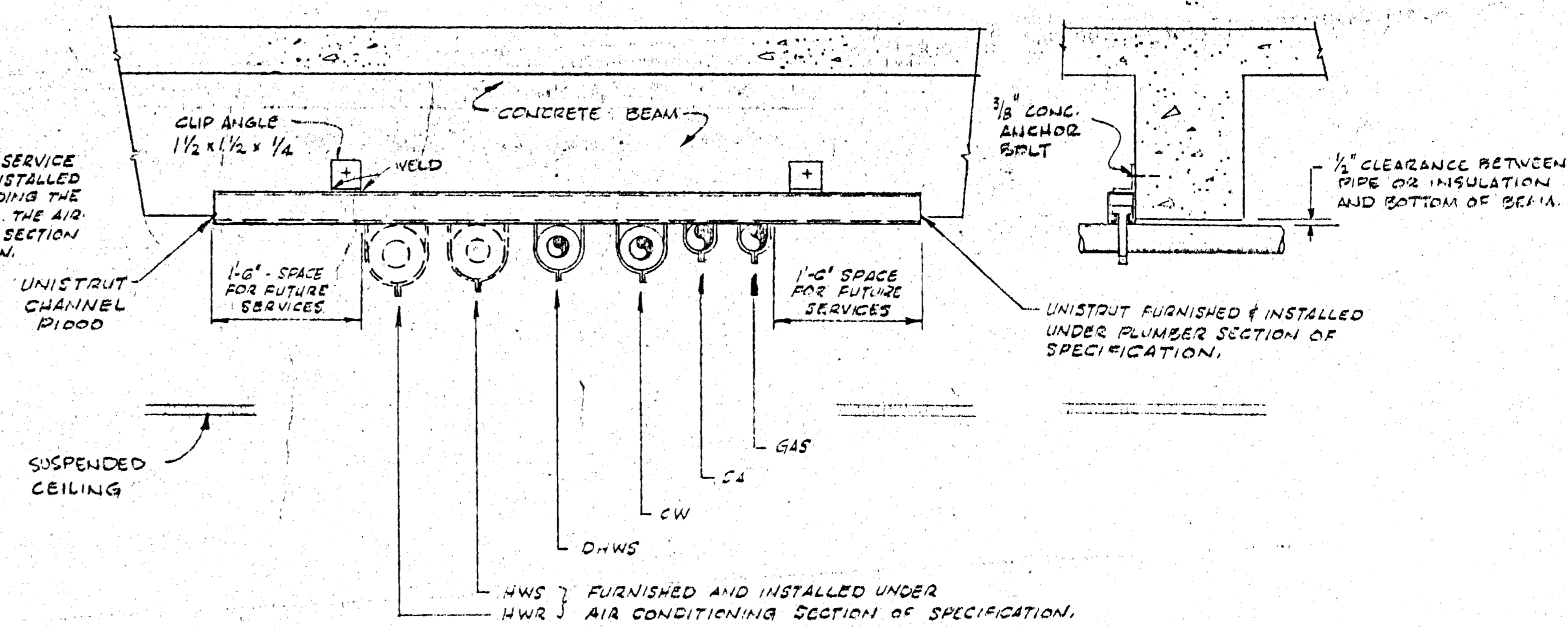
NOTE
1. FOR PLUMBING FIXTURE SCHEDULE AND LEGEND REFER TO DWS. 11-17



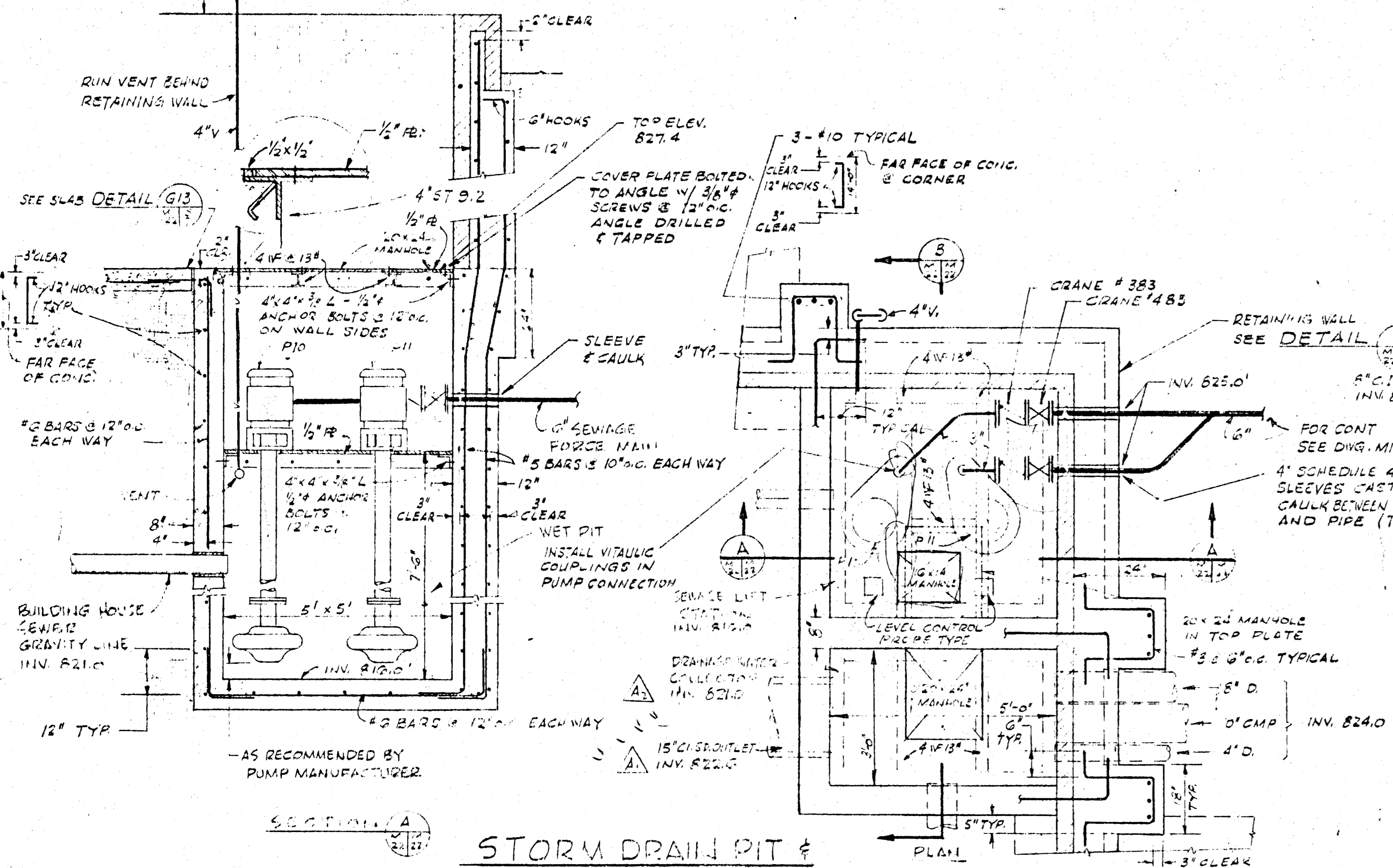
DOMESTIC HOT WATER STORAGE HEATER
PIPING HOOK-UP DETAIL (1)



AIR COMPRESSOR & AFTERCOOLER
PIPING HOOK-UP DETAIL (2)

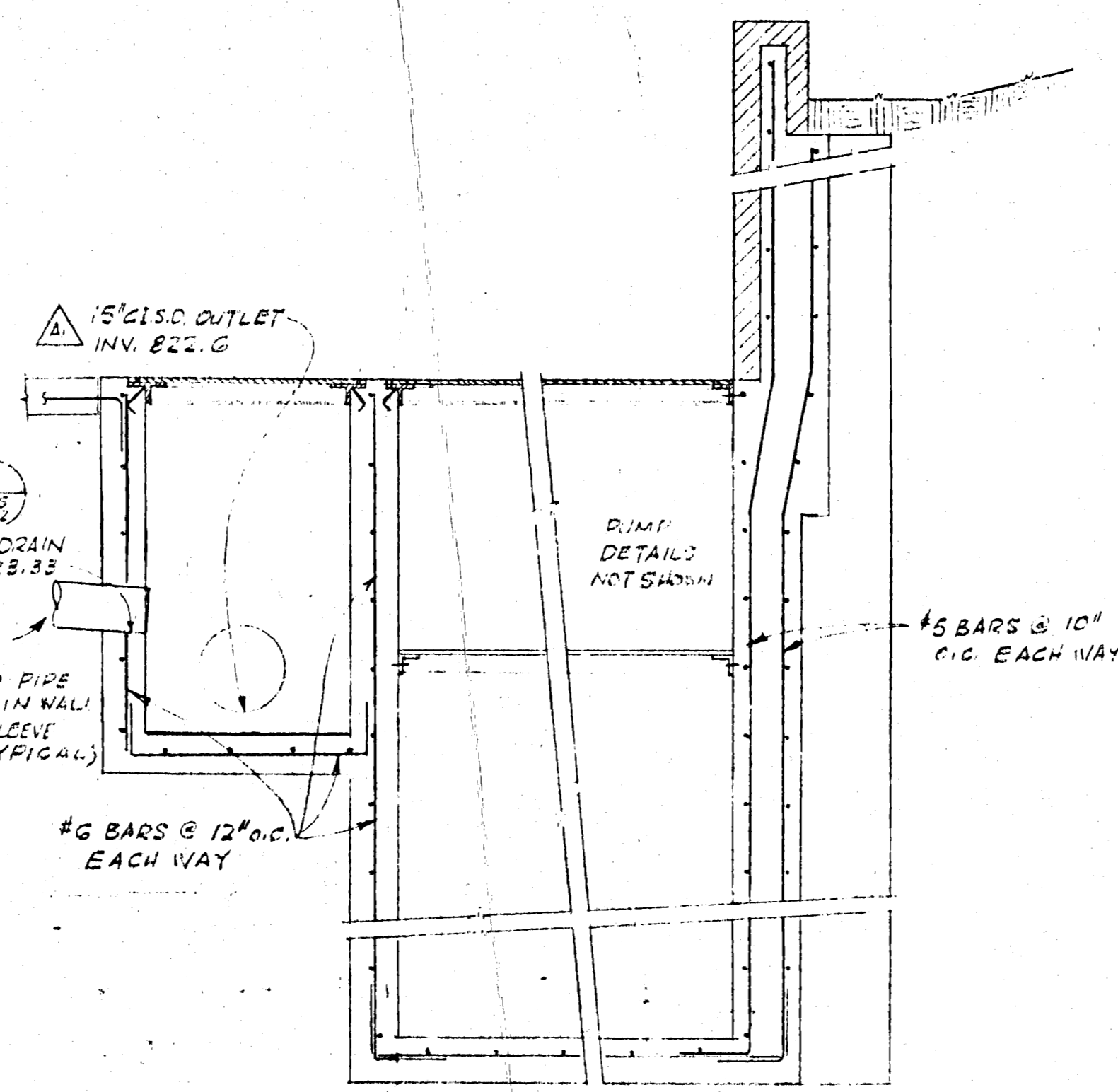


PIPE SUPPORT DETAIL (3)
N.T.S.

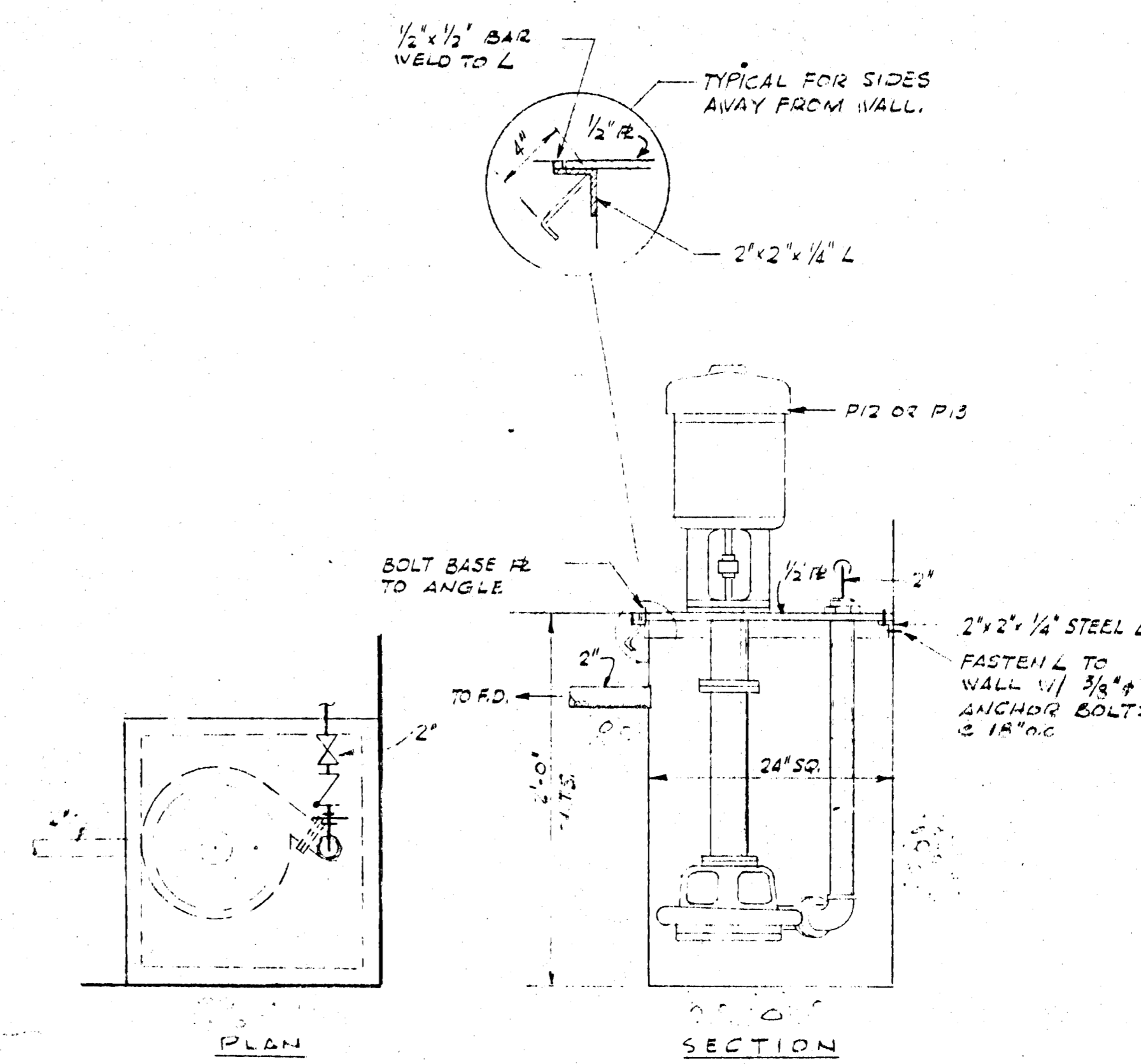


STORM DRAIN PIT &
SEWAGE LIFT STATION PUMPS & PIT DETAIL (4)
SCALE 1/2" = 1'-0"

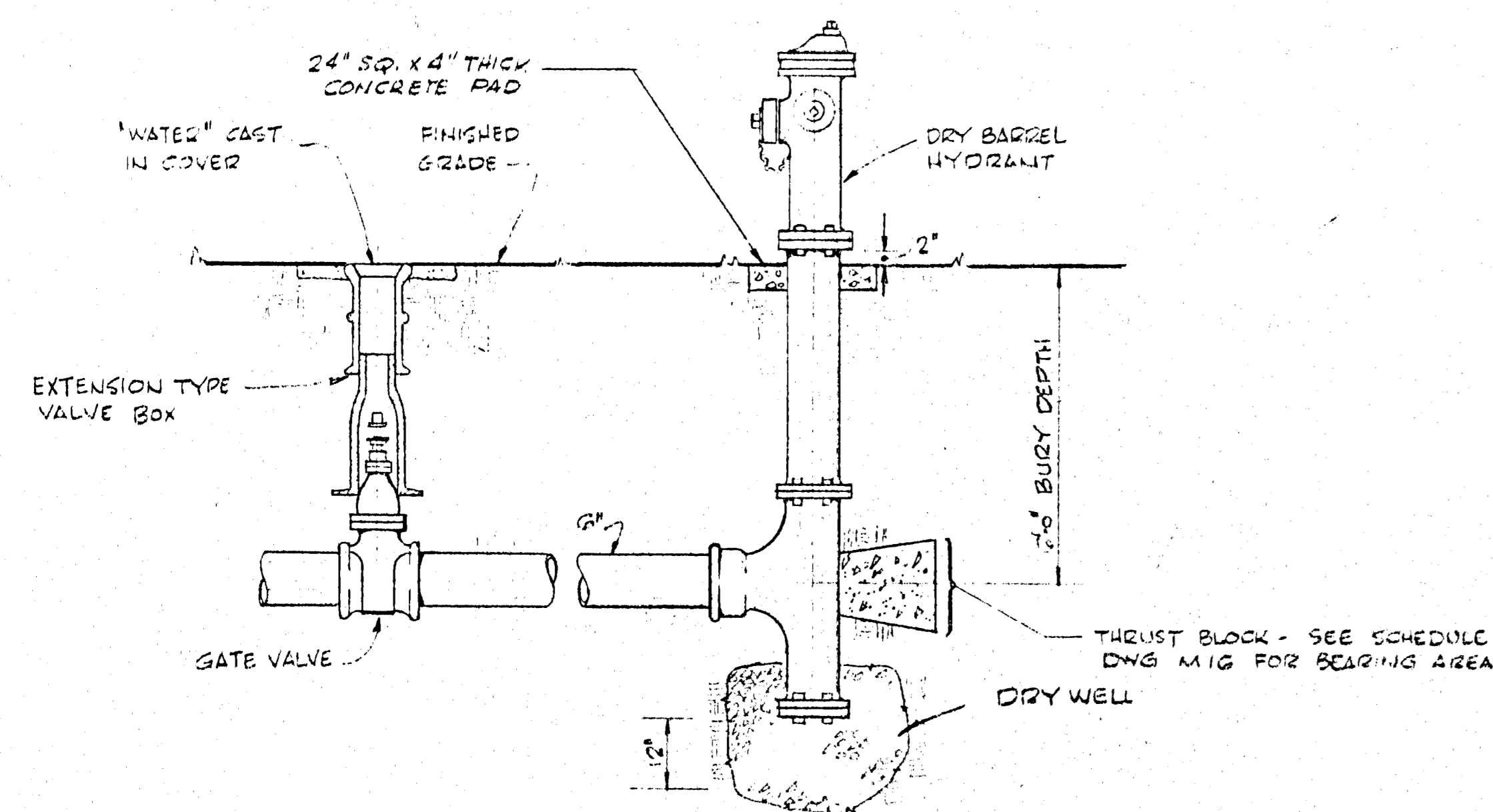
PIT CONSTRUCTED BY GENERAL CONTRACTOR
STEEL PLATE AND ANGLES BY PLUMBER



SECTION B
SCALE 1/2" = 1'-0"



ELEVATOR SUMP PUMP DETAIL (6)
SCALE 1" = 1'-0"



FIRE HYDRANT DETAIL (5)
N.T.S.

APPROVED FOR
CONSTRUCTION

DATE	BY	CHKD	APPD
12/15/83	WMB	WMB	WMB

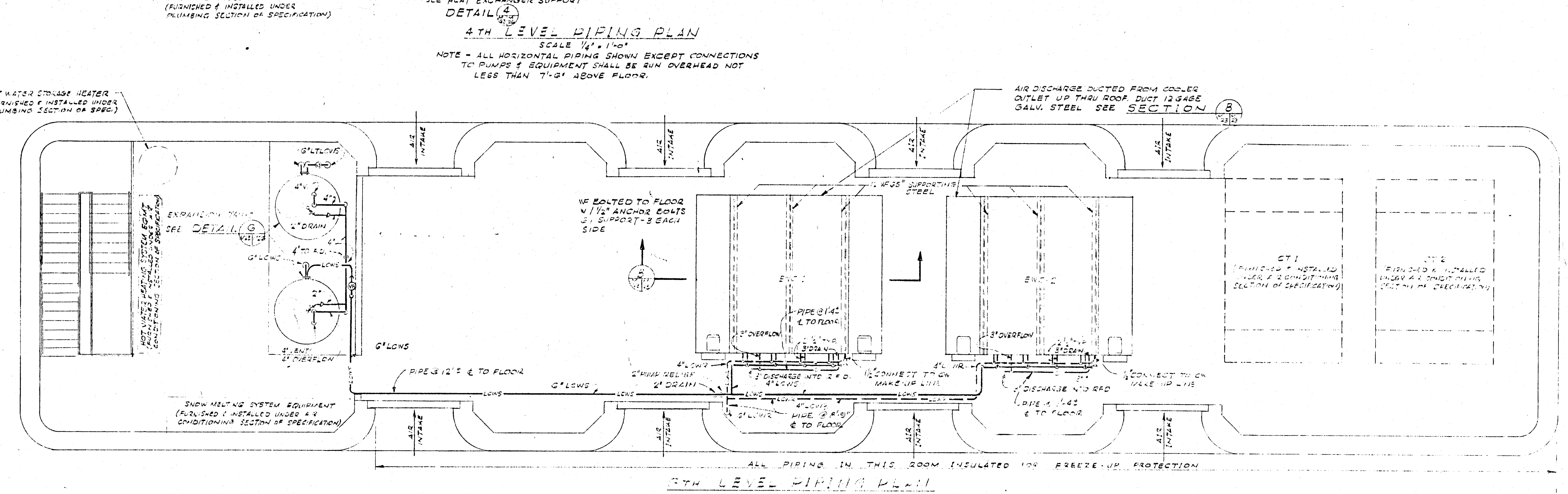
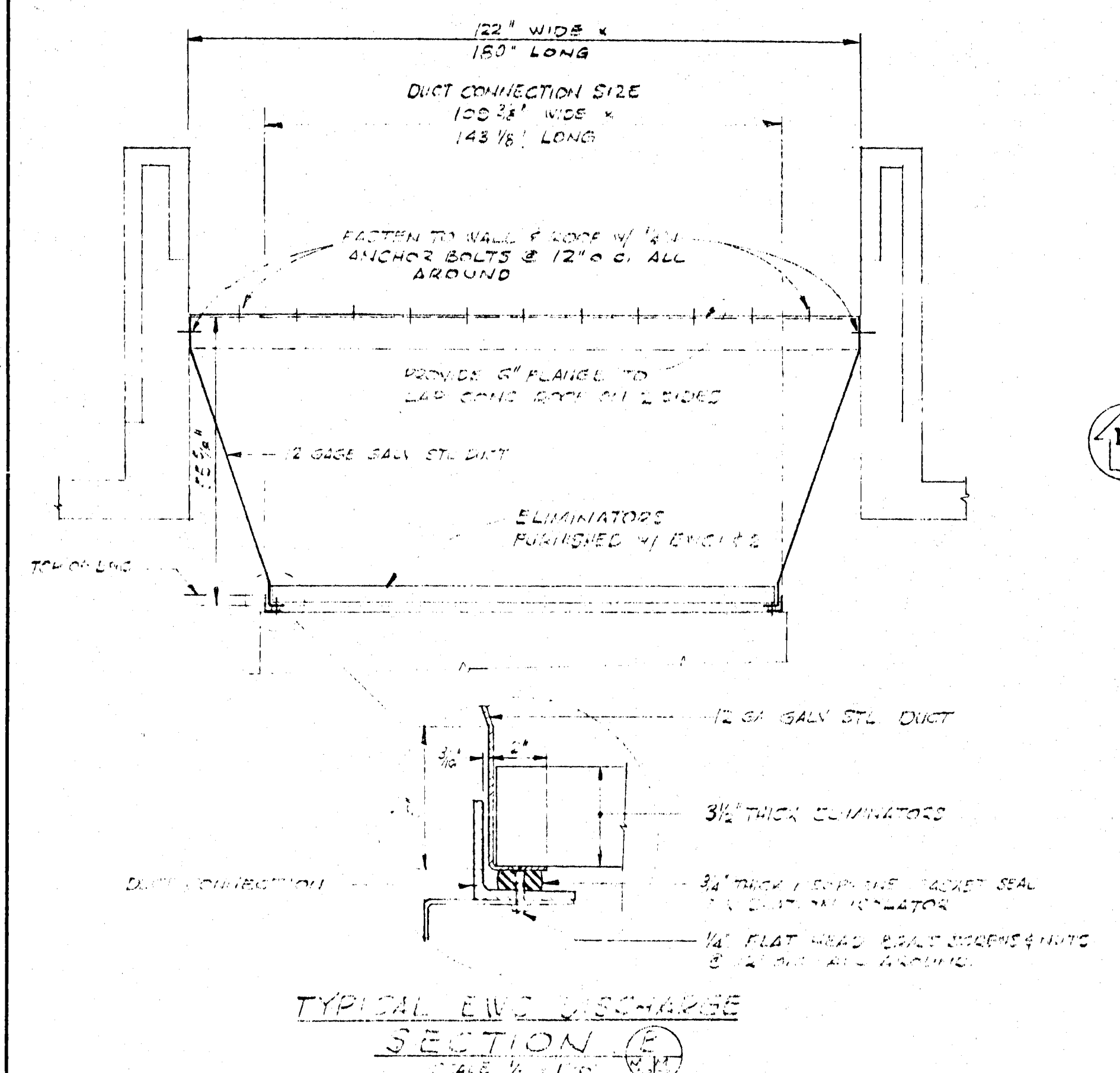
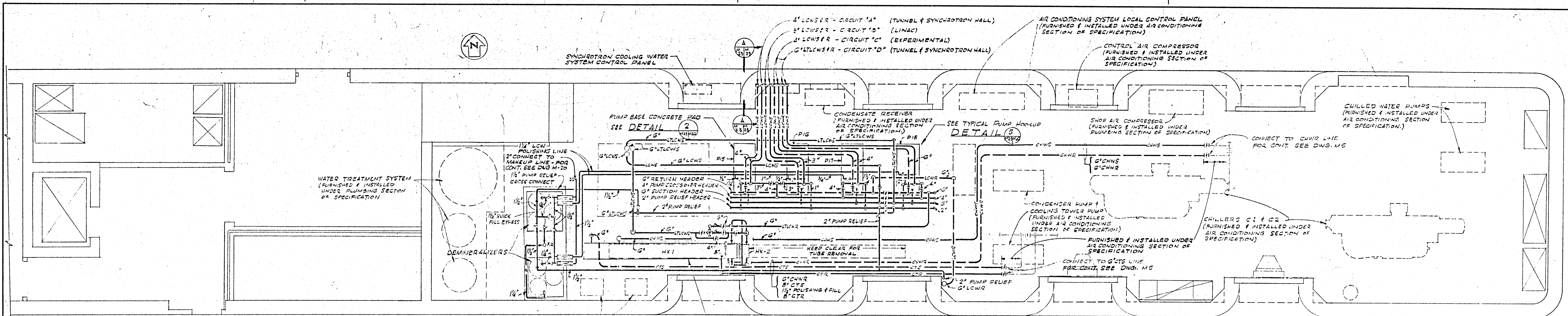
IO GEV CORNELL
SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA NEW YORK

PLUMBING
UTILITIES
DETAILS

WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
FREGNOFF & MATHEU STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
150 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-524-8864

DR. ZOEGL	CHKD	DATE	SCALE
WMB	WMB	12/15/83	NOTED
RELEASED	APPROVED	SHEET	OF
		66	102
LAB NUCLEAR STUDIES		DRAWING NO.	
DATE NOV. 15, 1983	DATE JAN. 13, 1984	WMB & A NO. 1115	

NOTE
1. FOR EQUIPMENT SCHEDULES AND LEGENDS REFER TO DWG M7

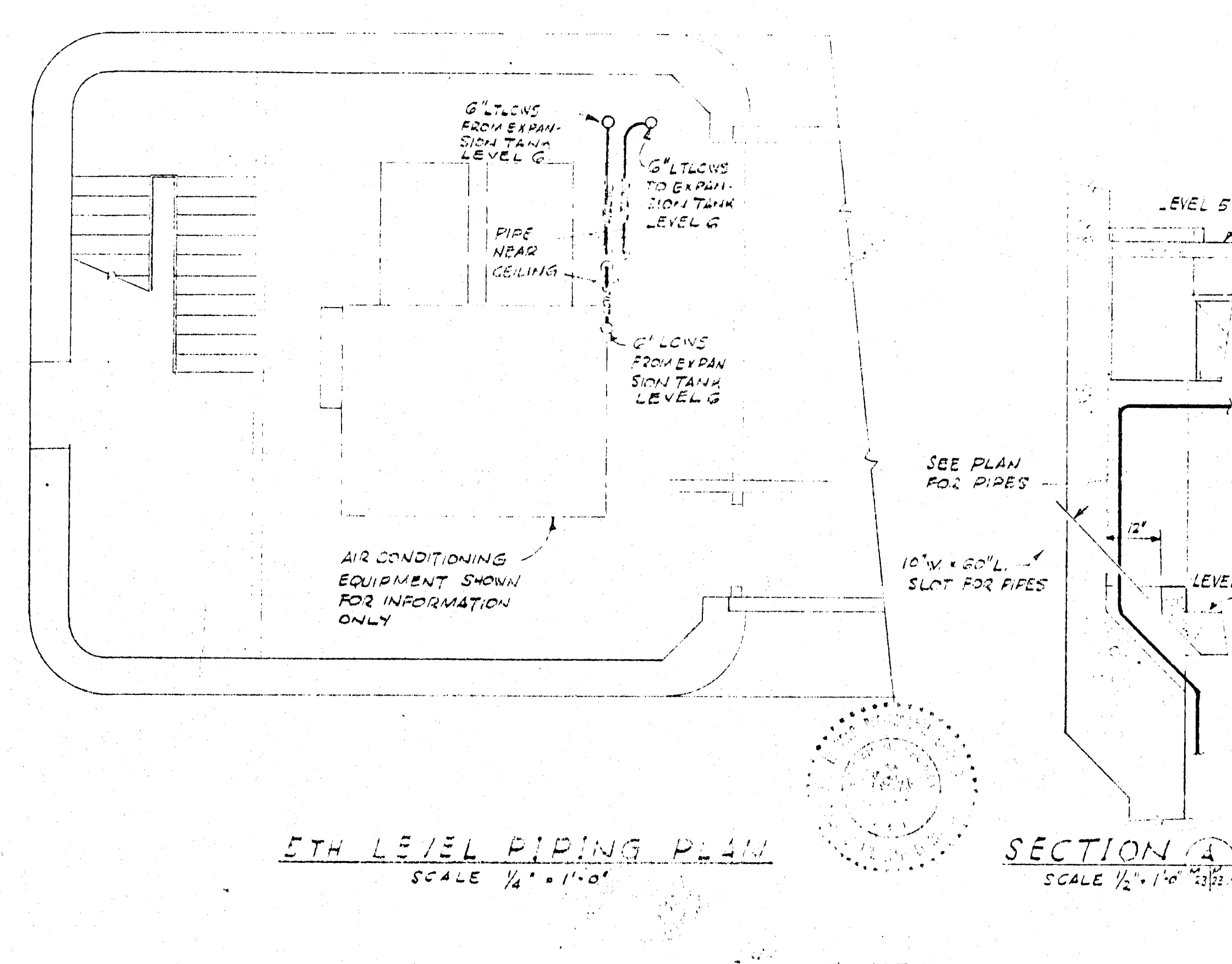


EQUIPMENT SCHEDULE											
EVAPORATIVE WATER COOLERS											
UNIT NO.	CAPACITY BTU/HR	WATER				AIR		FAN MOTOR HP	SPRAY MOTOR HP	BALTIMORE AIR COIL MODEL NO.	
		FLOW GPM	PRESS. DROP PSI	TEMP. ENT. °F	TEMP. LGV. °F	WET BULB °F	VOLUME CFM				EXT. STATIC IN. W.G.
ENC 1	3,000,000	247	3.37	115	80	75	50,000	0.4'	240	2	C100-B
ENC 2	3,000,000	247	3.37	115	80	75	50,000	0.4'	240	2	C100-B

HEAT EXCHANGERS												
UNIT NO.	CAPACITY BTU/HR	SHELL SIDE				TUBE SIDE				AMERICAN STANDARD MODEL NO.		
		FLOW GPM	TEMP. ENT. °F	TEMP. LGV. °F	FOUL FACTOR	FLOW GPM	TEMP. ENT. °F	TEMP. LGV. °F	FOUL FACTOR			
HX1	3,750,000	600	52	645	15	0.001	380	84	65	5	0.0005	1714-5CP
HX2	3,750,000	1450	55	66.2	10	0.0015	380	84	65	5	0.0005	1918 CP

PUMPS								
UNIT NO.	SERVICE	CAPACITY		SPEED RPM	MINIMUM EFFICIENCY %	MOTOR HP	GOULD	
		GPM	HEAD FT.				MODEL	SIZE
P15	TUNNEL & SYNCHROTRON HALL	175	231	3500	50	25	319G	2 x 5 x 8
P16	LINAC	120	231	3500	45	20	319G	1 1/2 x 3 x 5
P17	EXPERIMENTAL	250	231	3500	50	30	319G	2 x 3 x 8
P18	65' LTLCW	400	231	3500	50	50	319G	3 x 4 x 8

ABBREVIATIONS		SYMBOLS	
LCW	LOW CONDUCTIVITY WATER	LTLCW	LOW TEMPERATURE, LOW CONDUCTIVITY WATER SUPPLY
N.C.	NORMALLY CLOSED	LTWR	LOW TEMPERATURE, LOW CONDUCTIVITY WATER RETURN
N.O.	NORMALLY OPEN	LWS	HIGH TEMPERATURE, LOW CONDUCTIVITY WATER SUPPLY
W.B.	WET BULB	LWR	HIGH TEMPERATURE, LOW CONDUCTIVITY WATER RETURN
LED	RECESSED FLOOR DRAIN	---	CAMPUS WATER
CW	COLD WATER	-D-	DRAIN
FD	FLOOR DRAIN	---	CHILLED WATER SUPPLY
TYP	TYPICAL	---	CHILLED WATER RETURN
STL	STEEL	---	BALL VALVE
		---	BUTTERFLY VALVE
		---	CHECK VALVE
		---	SOLENOID VALVE
		---	STEAMER
		---	FLOW RATE INDICATOR
		---	FLOW DIRECTION
		---	THERMOMETER
		---	THERMOSTAT
		---	PRESSURE GAUGE
		---	FLOWSWITCH
		---	ALARM, PANEL MOUNTED
		---	MOTOR
		---	VACUUM BREAKER
		---	PUMP (END SUCTION TYPE)
		---	VENTURI WITH FLOW RATE INDICATOR



APPROVED FOR CONSTRUCTION

DATE	CHK'D	BY	APP'D	APP'D
11/15/56	W.M.B.	J.A.C.	J.A.C.	J.A.C.

IO GEV CORNELL SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA, NEW YORK

SYNCHROTRON COOLING WATER SYSTEM LEVELS 4, 5, 6 PLANS PACHED 11-56

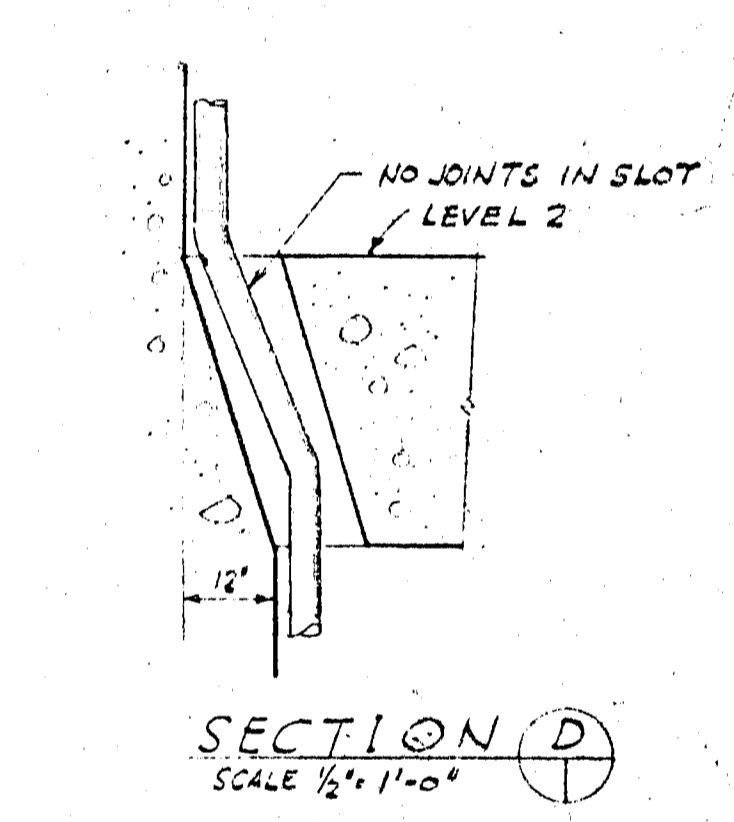
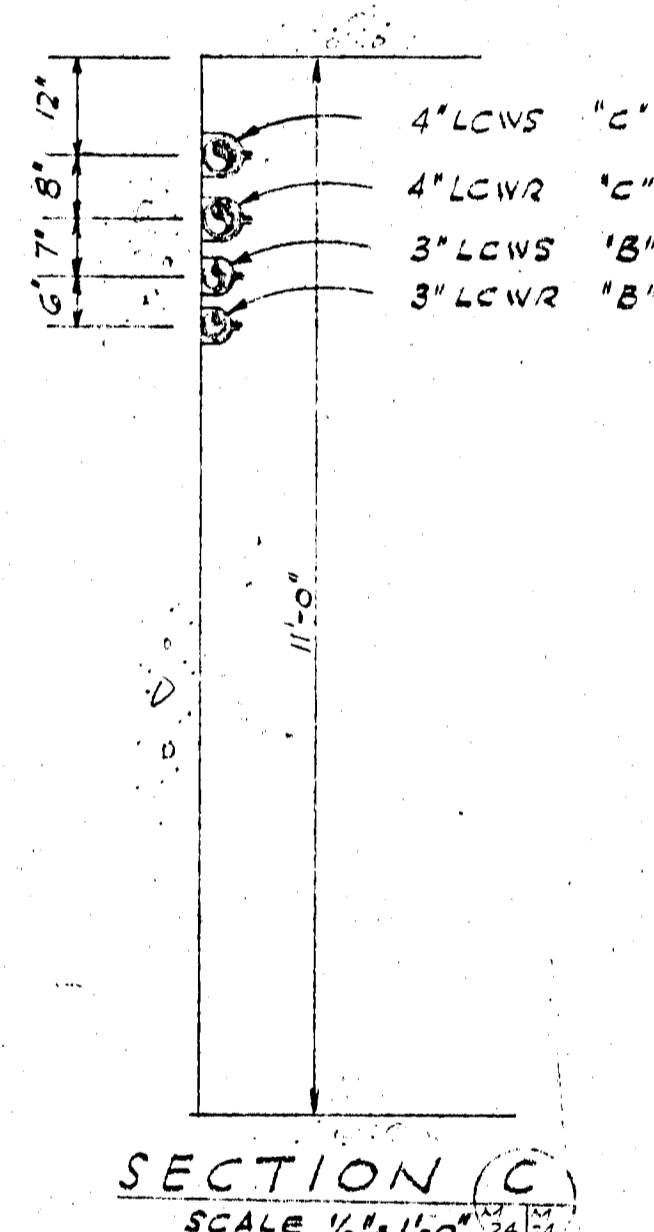
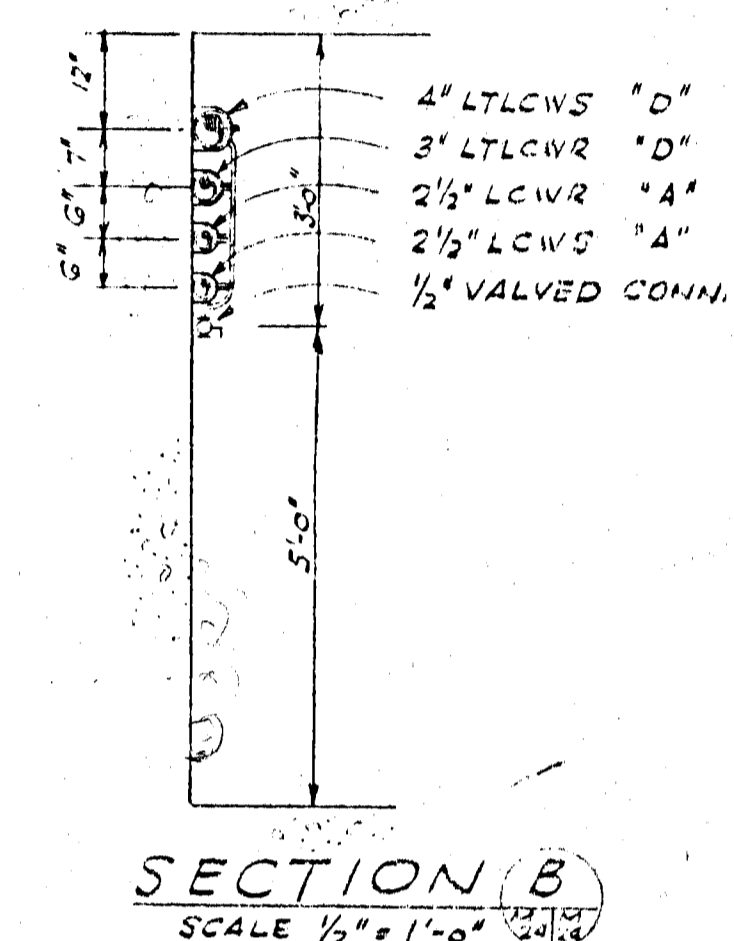
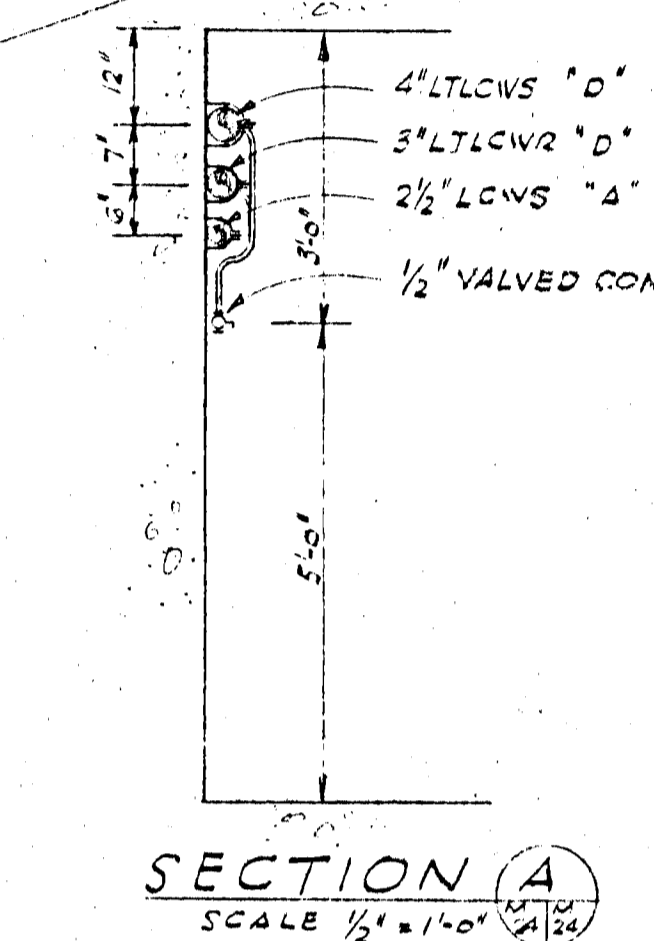
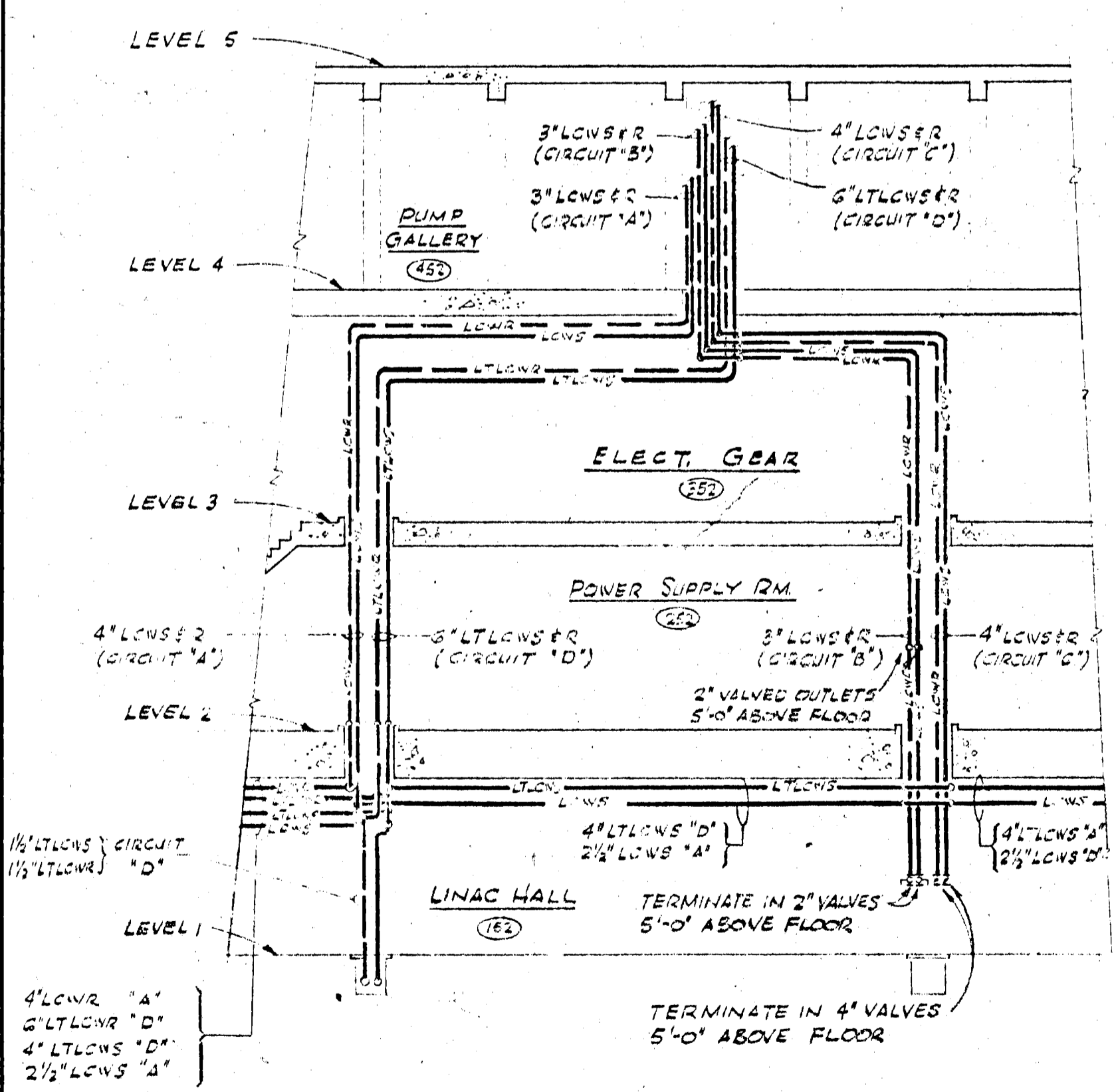
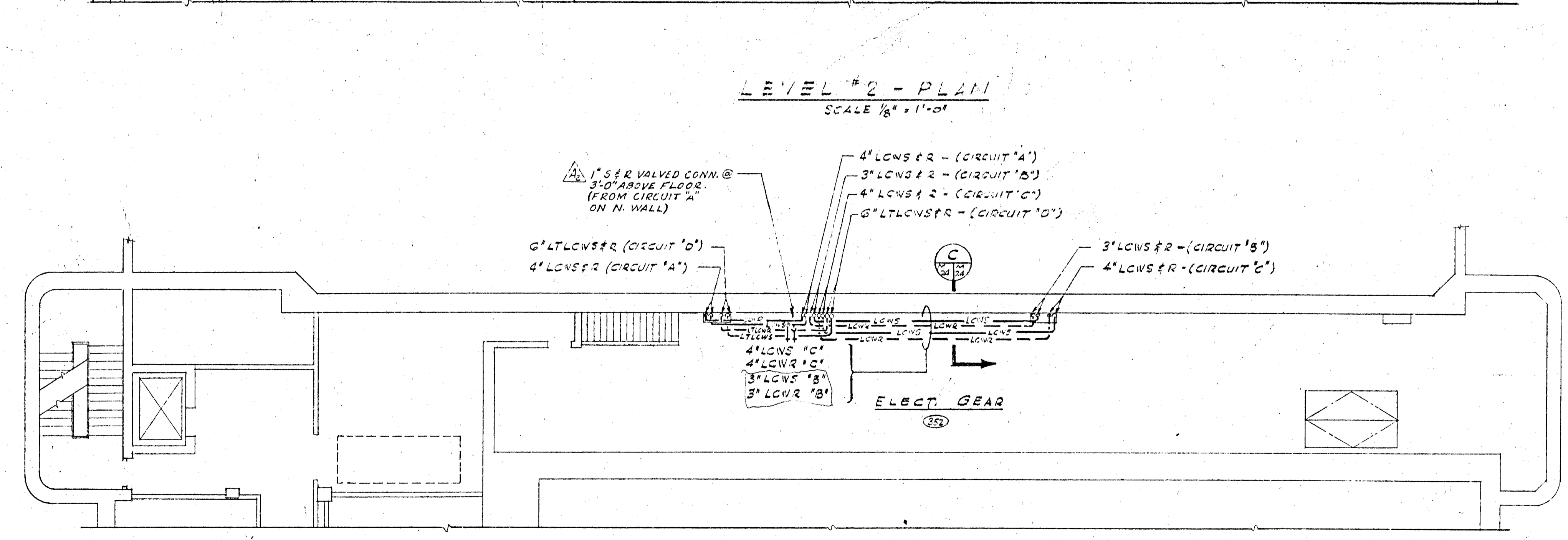
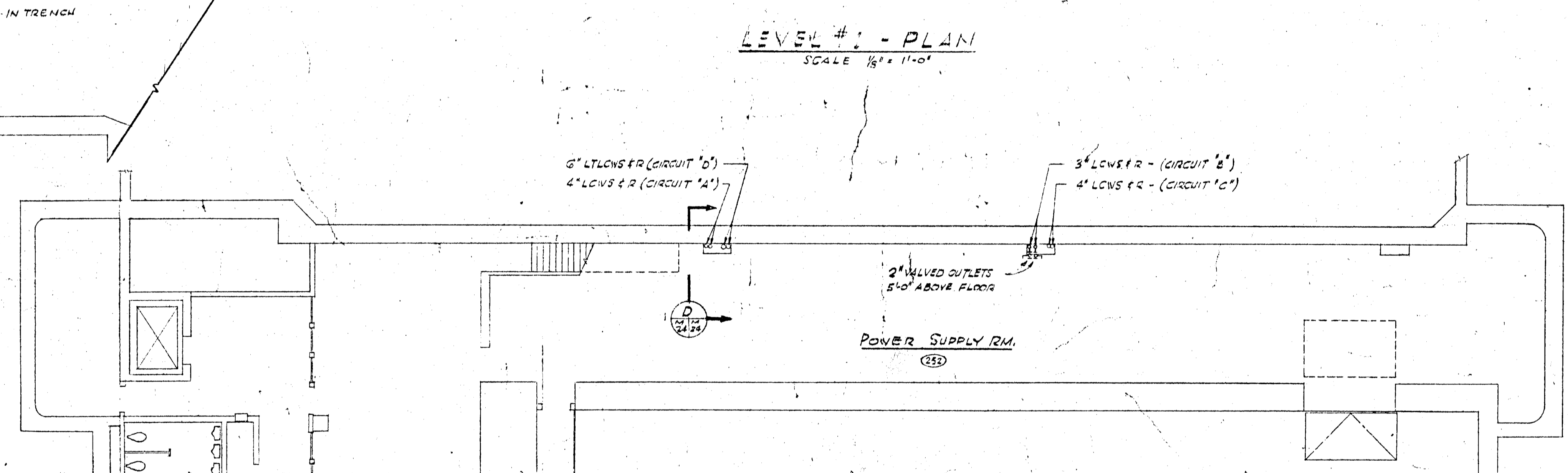
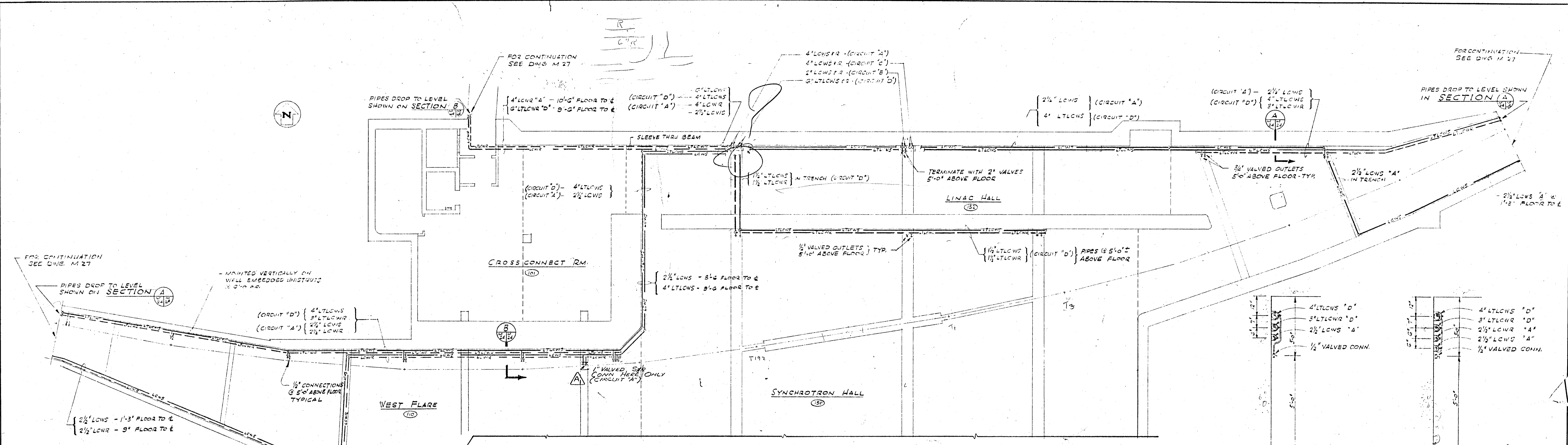
WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
FREGNOFF & MATHIEU STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-854-8664

DR. ROSSL CHK'D 11/15/56 SUPV. 11/15/56 SCALE NOTED

RELEASED APPROVED SHEET 63 OF 102
LAB NUCLEAR STUDIES
DRAWING NO. M-25-57
DATE 11/15/56 DATE 11/15/56 WMS & A NO. 1113

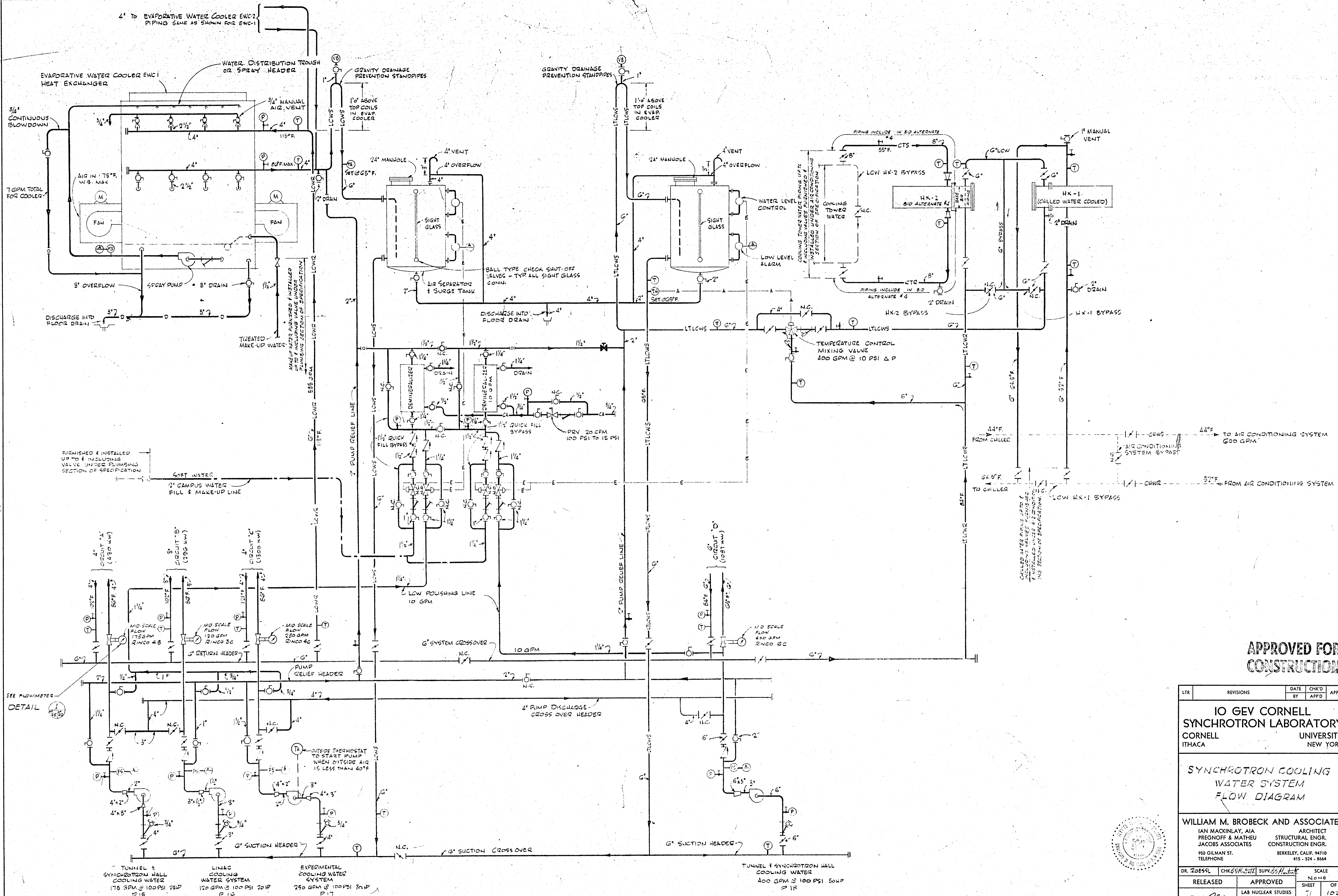
* HX-2 SHALL BE BID WITH BID ALTERNATE # 5

NOTES
1. REFER TO FLOW DIAGRAM DWG. M-25 FOR COMPLETE DETAILS OF ALL VALVES, GAGES, ETC.



NOTE
FOR LEGEND REFER TO DWG. 1122

1) RELOCATED & SEED VALVES 2) ADDED 1" S&R VALVES RM 352		5-13-66 GMS WMS	11/24/66 WMS WMS
LTR	REVISIONS	DATE	CHKD
		BY	APP'D
IO GEV CORNELL SYNCHROTRON LABORATORY CORNELL UNIVERSITY ITHACA, NEW YORK			
SYNCHROTRON COOLING WATER SYSTEM LEVELS 1, 2 & 3 PLANS & SECTIONS			
WILLIAM M. BROBECK AND ASSOCIATES IAN MACKINLAY, AIA ARCHITECT PREGNOFF & MATHEU STRUCTURAL ENGR. JACOBS ASSOCIATES CONSTRUCTION ENGR. 950 GILMAN ST. BERKELEY, CALIF. 94710 TELEPHONE 415 - 824 - 8864			
DR. ZWESL	CHKD. (M. S.)	SUPV. (M. S.)	SCALE
RELEASED	APPROVED		1/8" = 1'-0"
			SHEET
			OF
			102
			DRAWING NO.
			M 246
			DATE NOV. 15, 1966
			DATE NOV. 15, 1966
			WMB & A NO. 111-5
APPROVED FOR CONSTRUCTION			



APPROVED FOR CONSTRUCTION

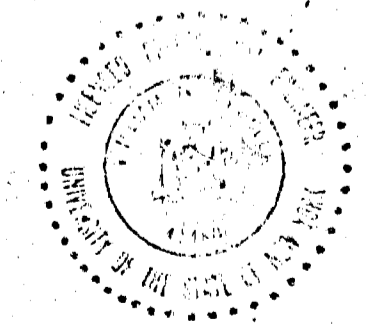
LTR	REVISIONS	DATE	CHKD		APPD
			BY	APPD	

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 CORNELL UNIVERSITY
 ITHACA NEW YORK

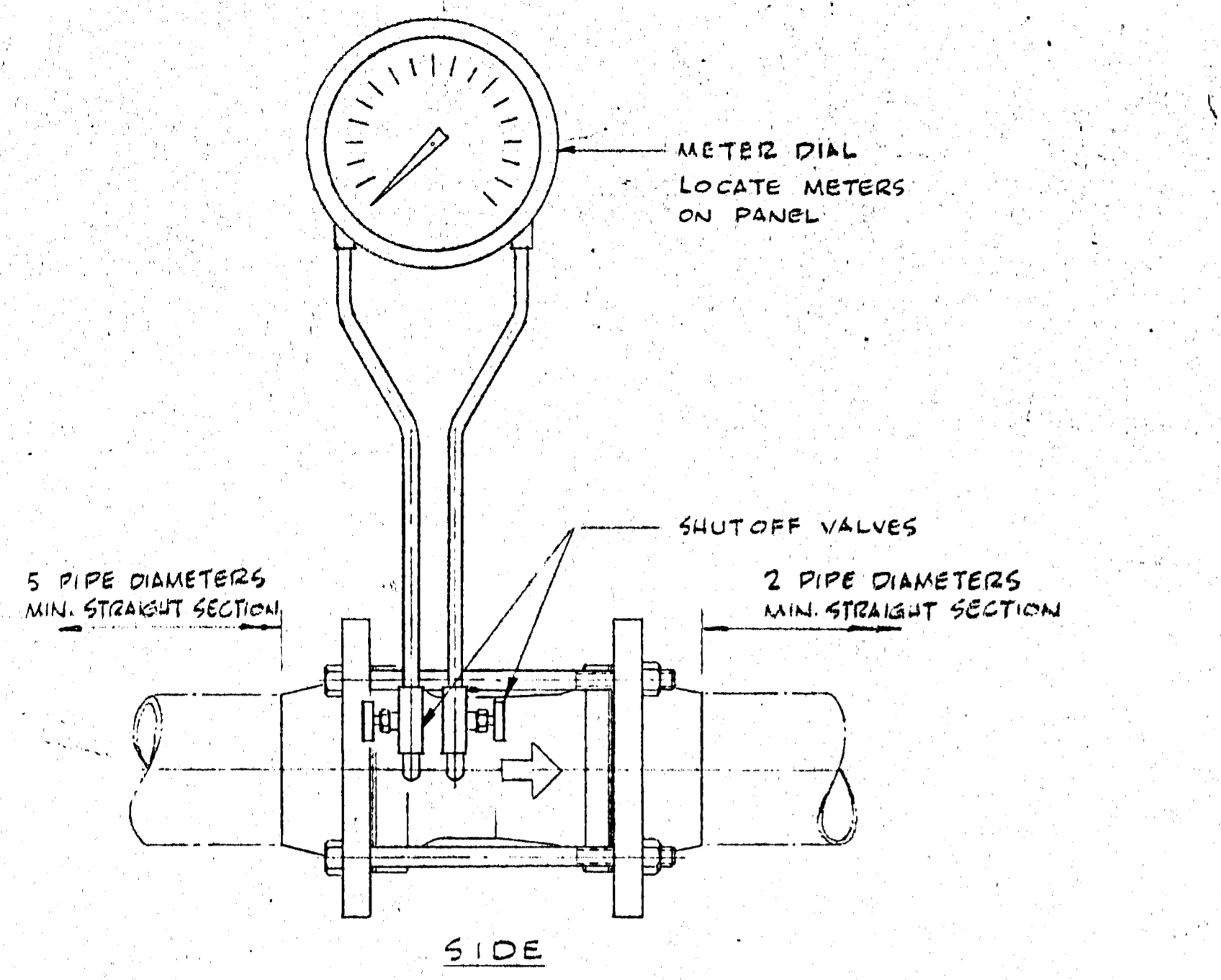
SYNCHROTRON COOLING WATER SYSTEM FLOW DIAGRAM

WILLIAM M. BROBECK AND ASSOCIATES
 IAN MACKINLAY, AIA ARCHITECT
 PREGNOFF & MATHEU STRUCTURAL ENGR.
 JACOBS ASSOCIATES CONSTRUCTION ENGR.
 950 GILMAN ST. BERKELEY, CALIF. 94710
 TELEPHONE 415-524-8864

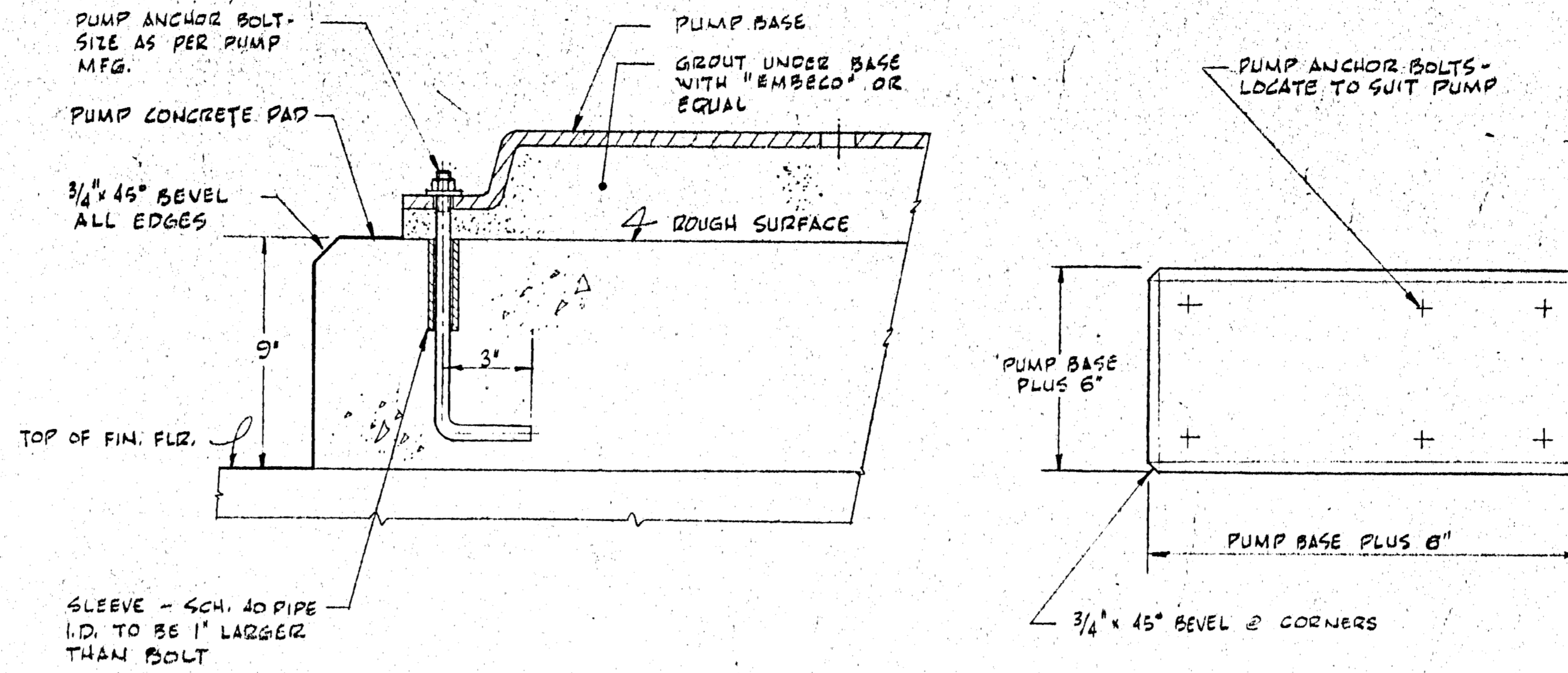
DR. 20655L	CHKD BY: <i>W.M. Brobeck</i>	SCALE: No. 1/4"
RELEASED	APPROVED	SHEET 71 OF 102
<i>T.H. Cline</i>	LAB NUCLEAR STUDIES	DRAWING NO. M 25
<i>W.M. Brobeck</i>	N.P. BUSINESS	DATE: JAN 15, 1972
DATE: 10/15/70	DATE: JAN 15, 1972	WMB & A NO. 1115



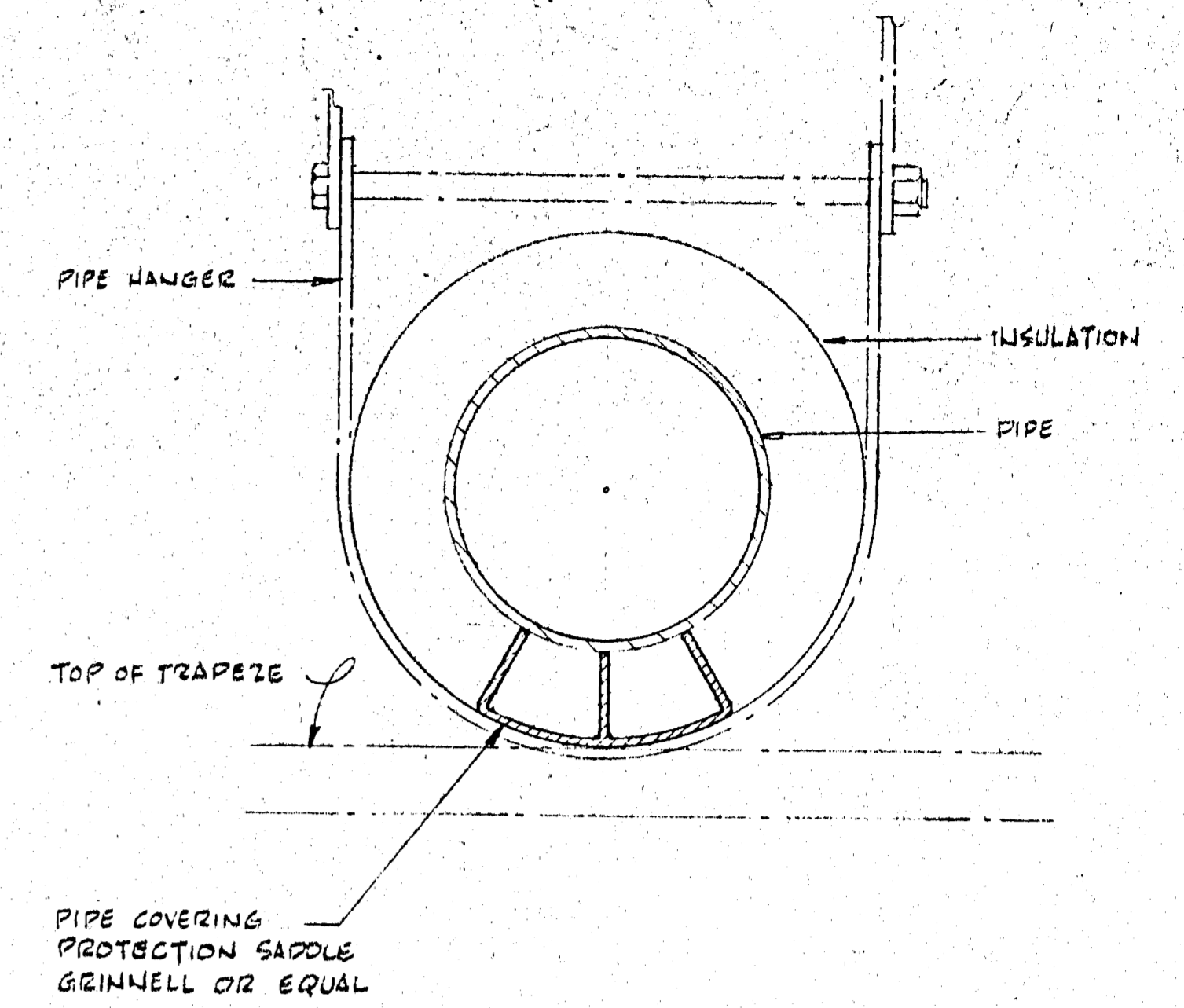
NOTE: FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG M 25 & M1



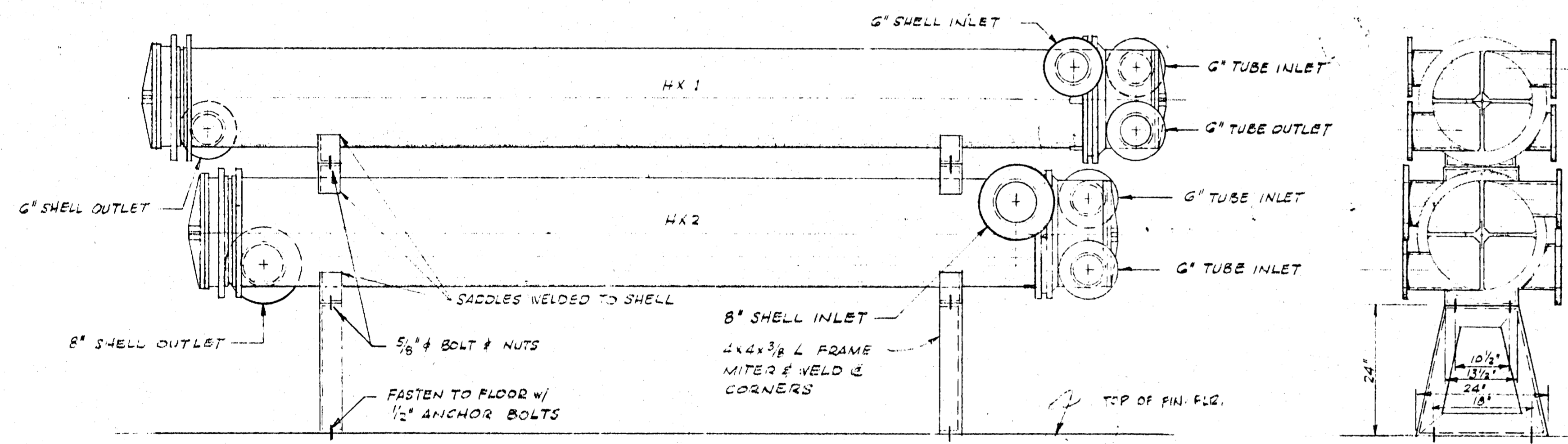
FLOWMETER DETAIL 1
NO SCALE



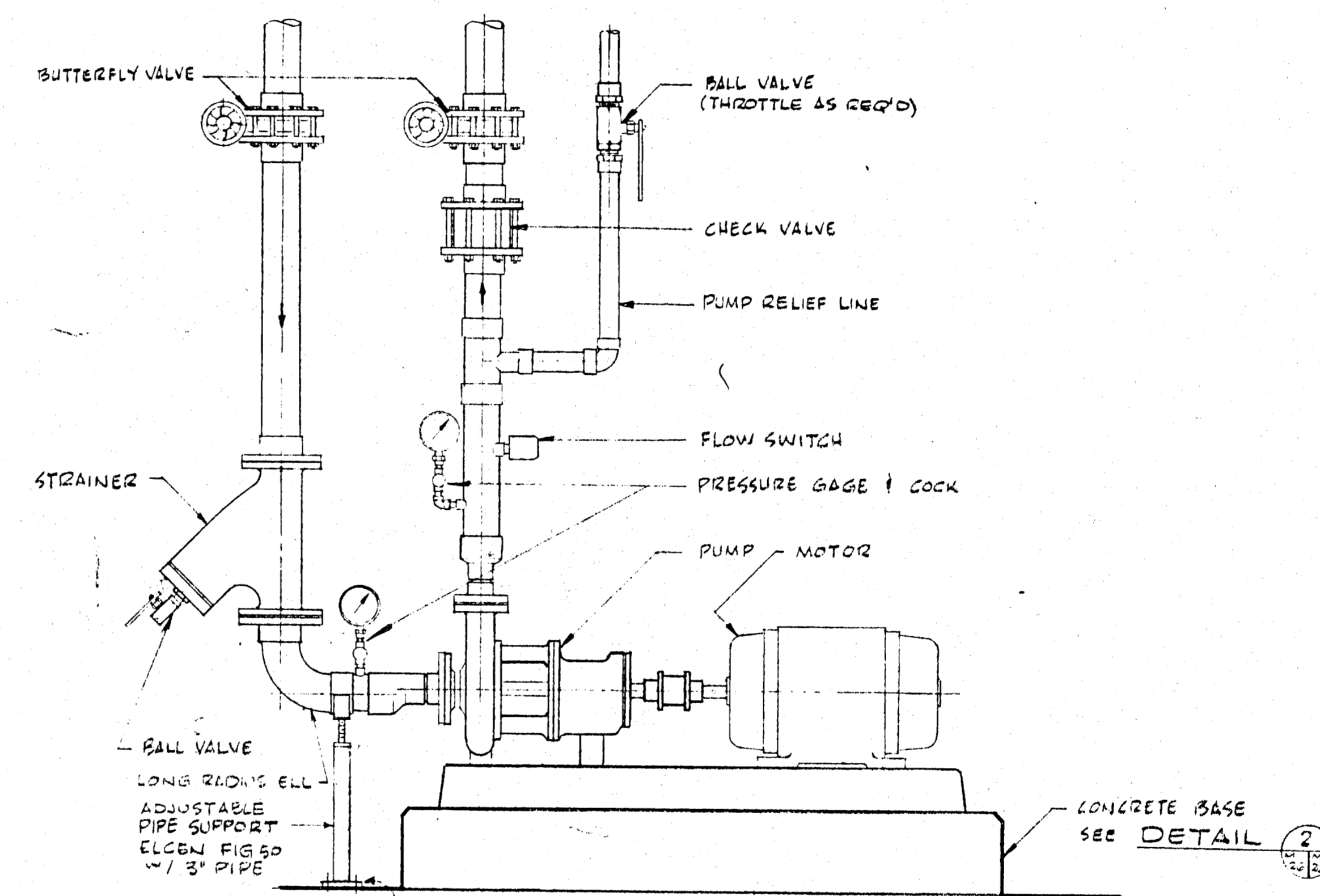
PUMP BASE CONCRETE PAD DETAIL 2
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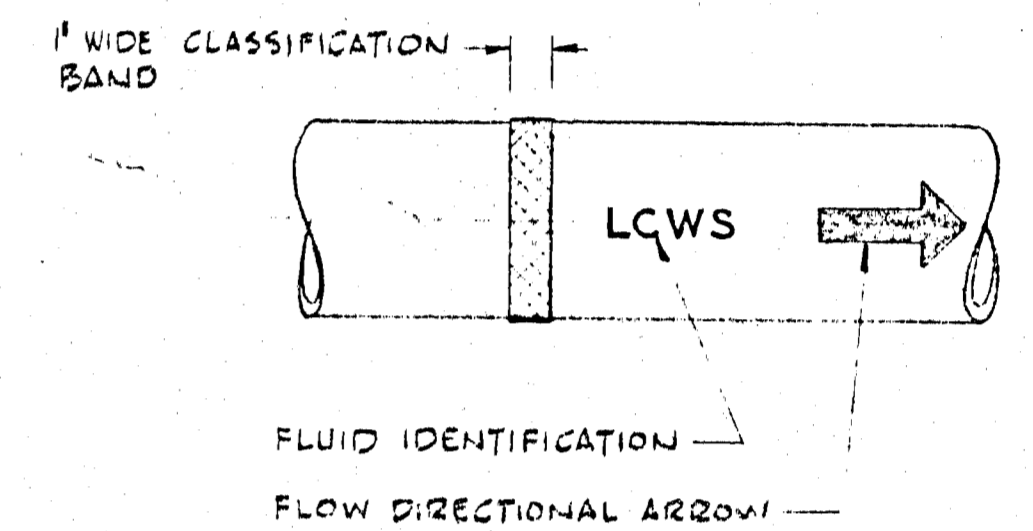
INSULATED PIPE SUPPORT DETAIL 3
NO SCALE



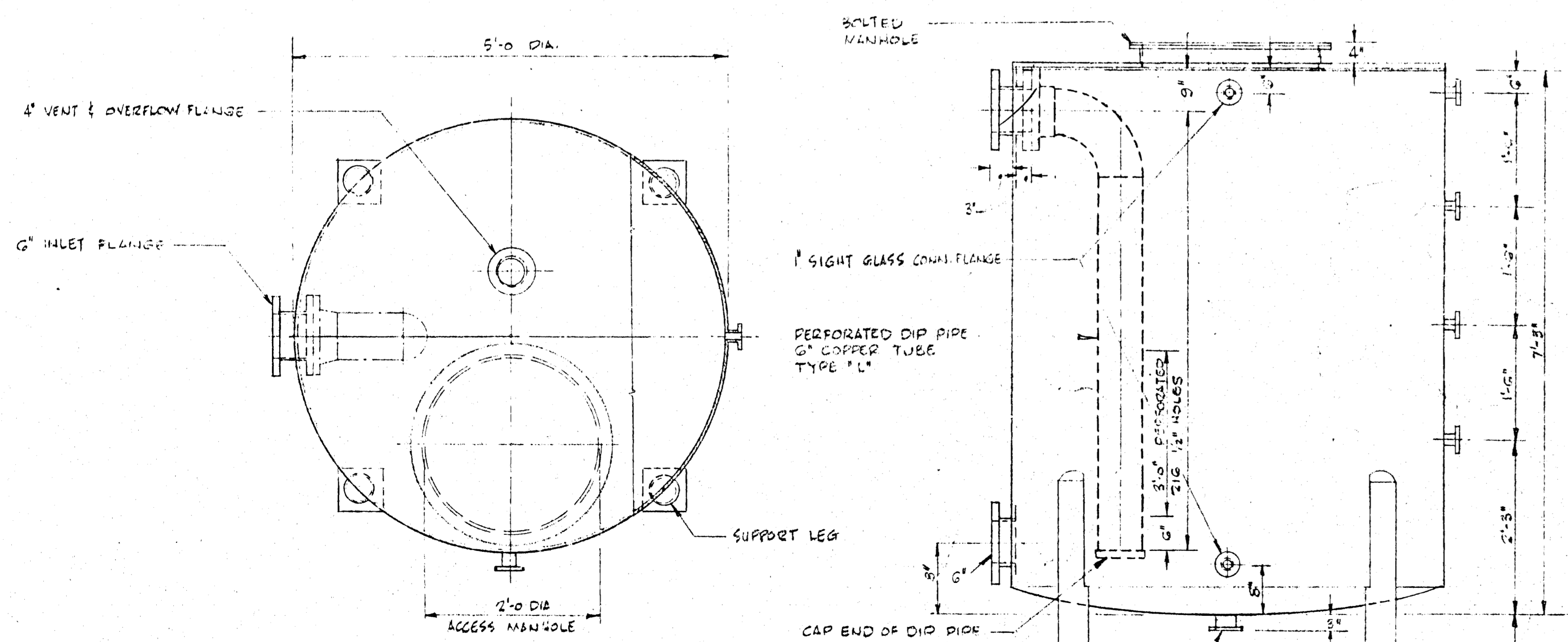
HEAT EXCHANGER SUPPORT DETAIL 4
SCALE 3/4" = 1'-0"



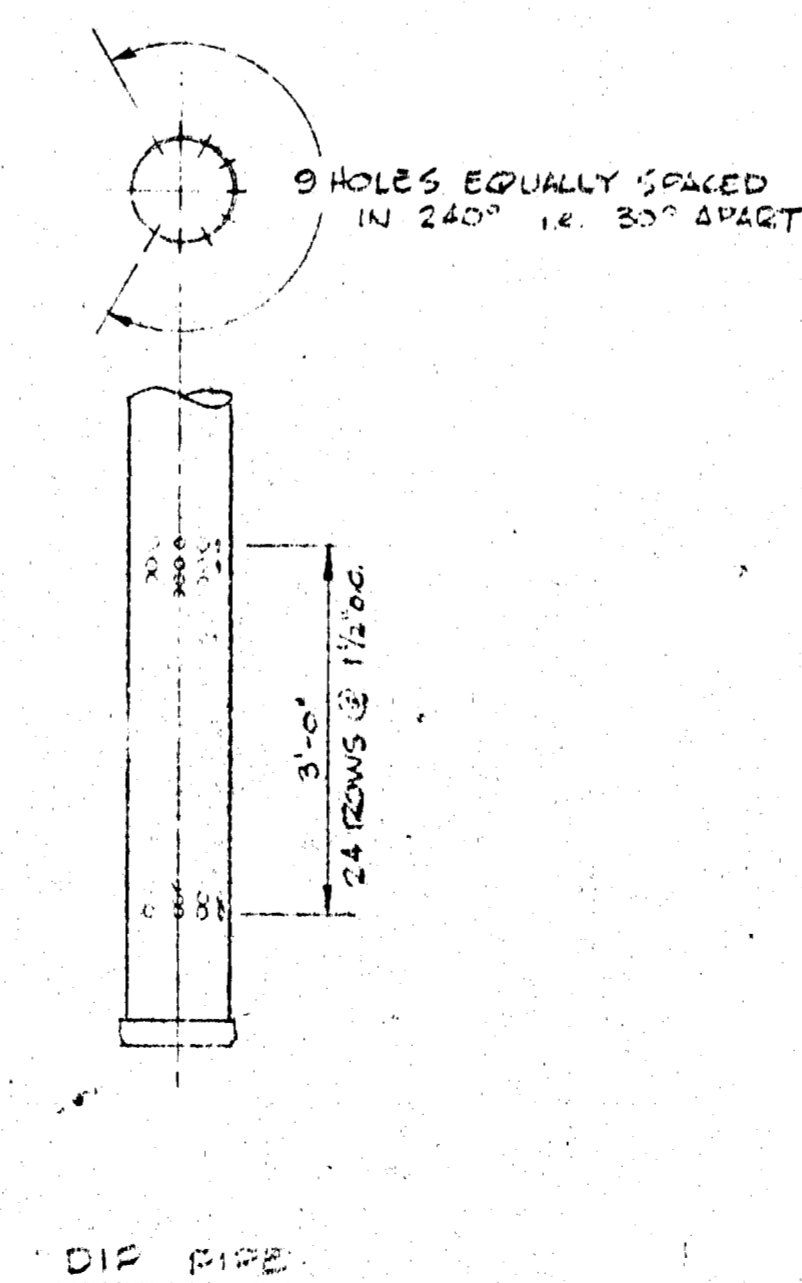
TYPICAL PUMP HOOKUP 5
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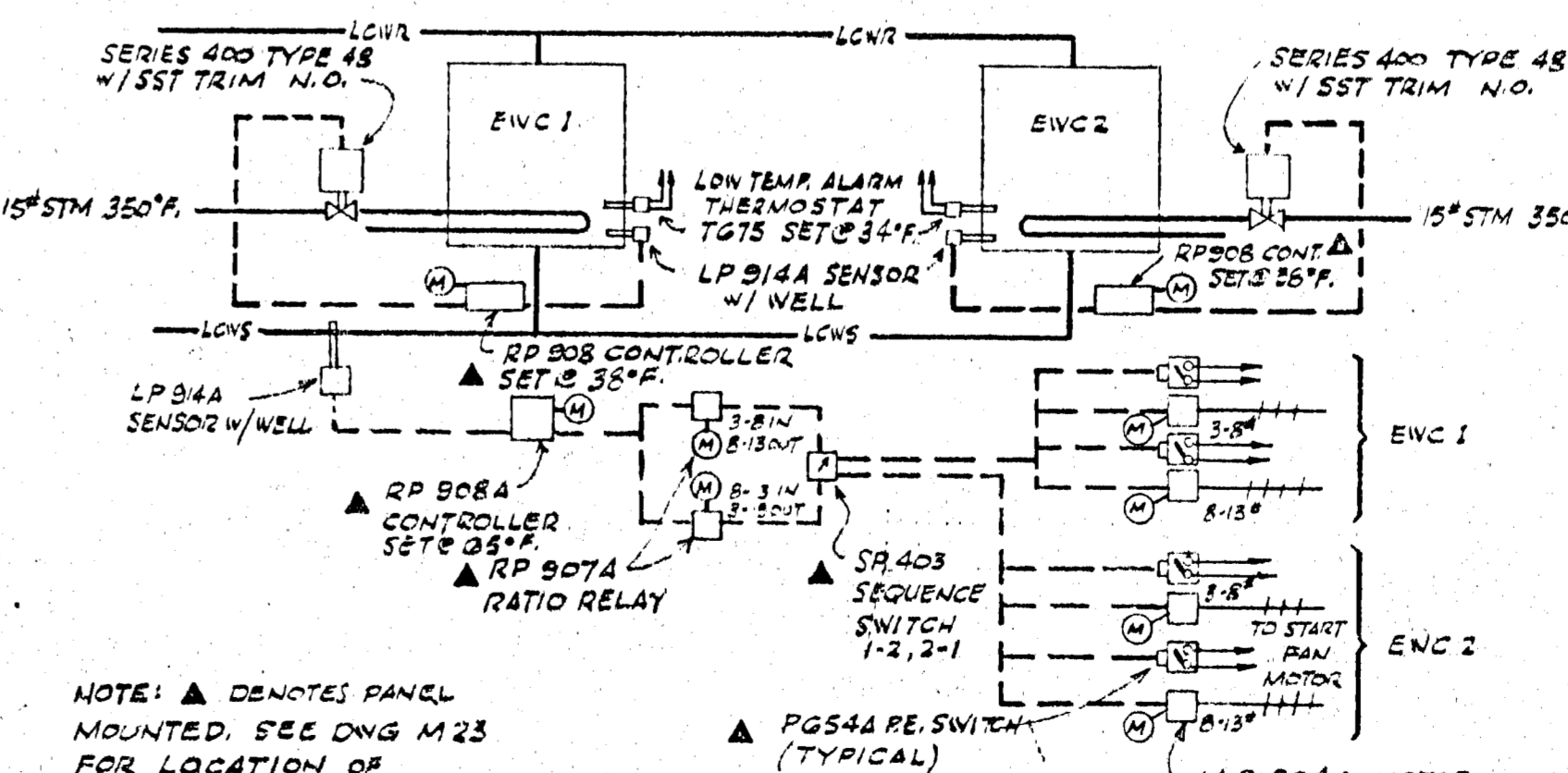
PIPING IDENTIFICATION DETAIL
NO SCALE



EXPANSION TANK DETAIL 6
NO SCALE



DIP PIPE



EVAPORATIVE WATER COOLER CONTROL DIAGRAM
NO SCALE

GENERAL NOTES
1. FOR EQUIPMENT SCHEDULE AND LEGEND REFER TO DWG M-23.
2. ELECTRICAL CONTROL WIRING FURNISHED AND INSTALLED UNDER ELECTRICAL SECTION OF SPECIFICATION, SEE DWGS E-18 & E-19.

APPROVED FOR CONSTRUCTION

REV	REVISIONS	DATE	CHKD	APP'D

IO GEV CORNELL
SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA NEW YORK

SYNCHROTRON COOLING
WATER SYSTEM
DETAILS

WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
FREGHOFF & MATHEU STRUCTURAL ENGR.
JACOBS ASSOCIATES CONSTRUCTION ENGR.
150 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-824-8884

DR.	CHKD.	DATE	SCALE
DR. ROESSL	CHKD. M. BROBECK	SUPP. 1/15/66	SCALE NOTED
RELEASED	APPROVED	BY	NOTED
T.M. Lane	LAB NUCLEAR STUDIES		SHEET 72 OF 102
W.M. Brobeck	VP-BUSINESS		DRAWING NO. M-23
DATE: NOV. 18, 1962	DATE: JAN. 15, 1966		WMB & A. NO. 111-5

LEGEND

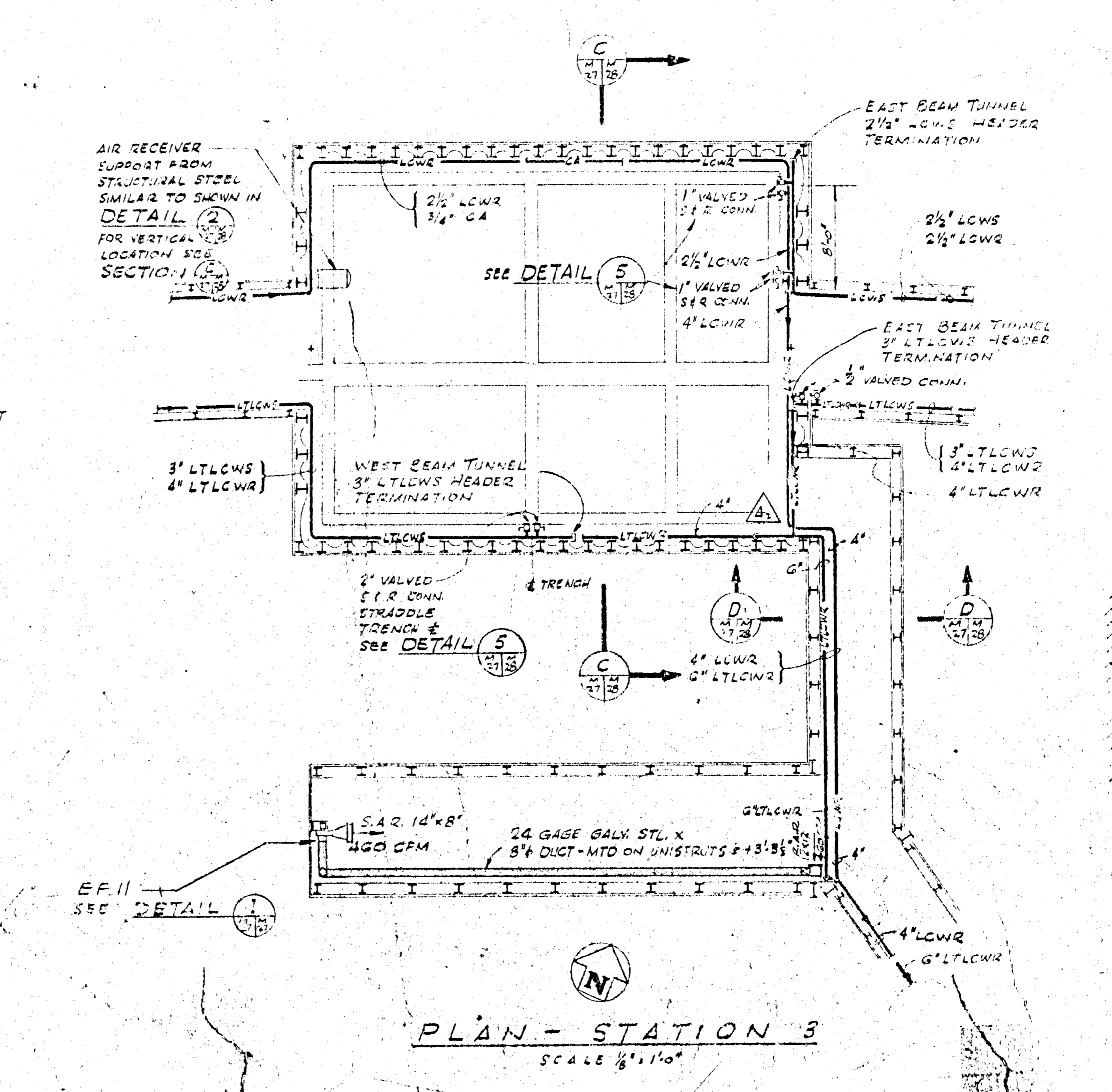
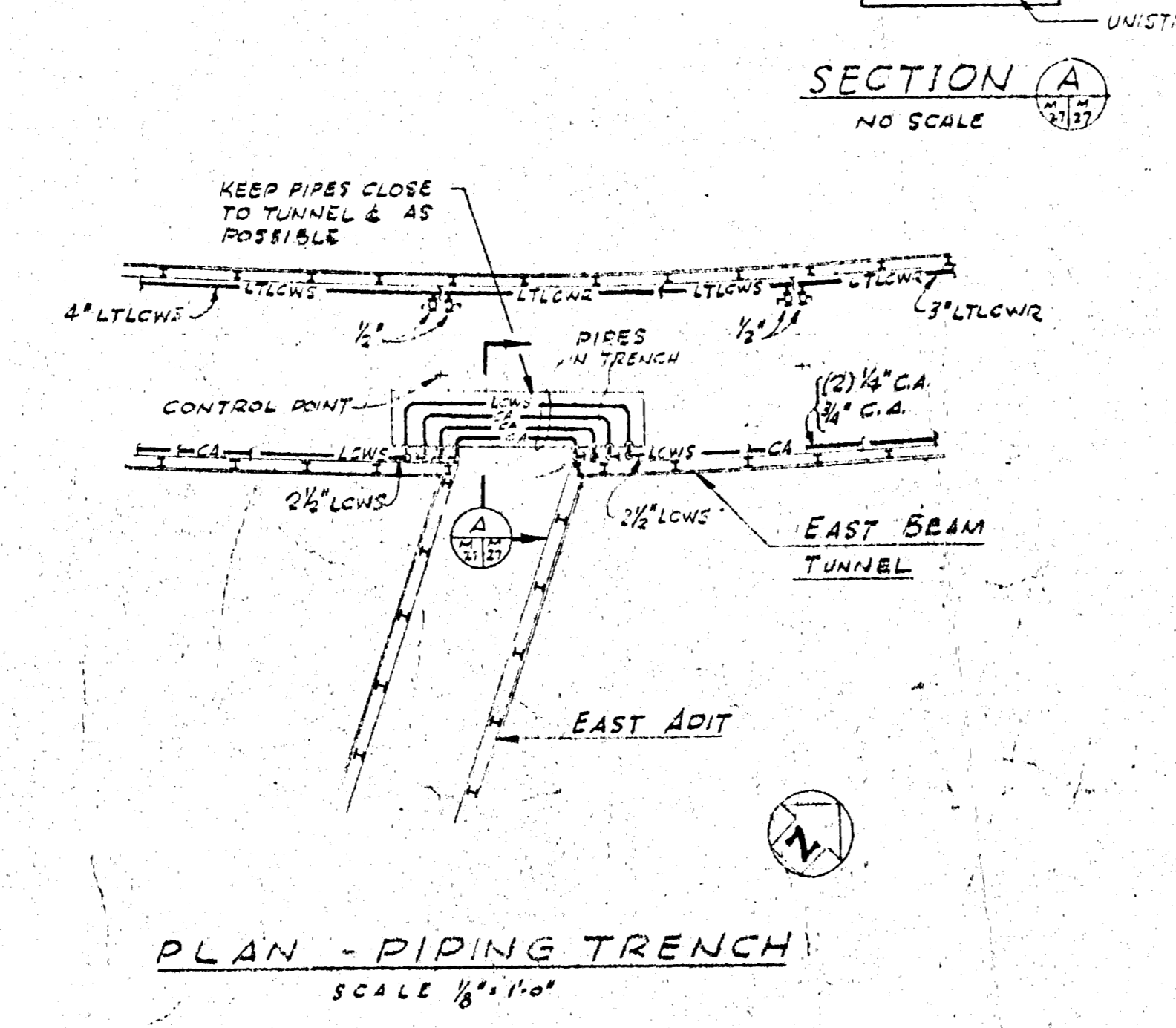
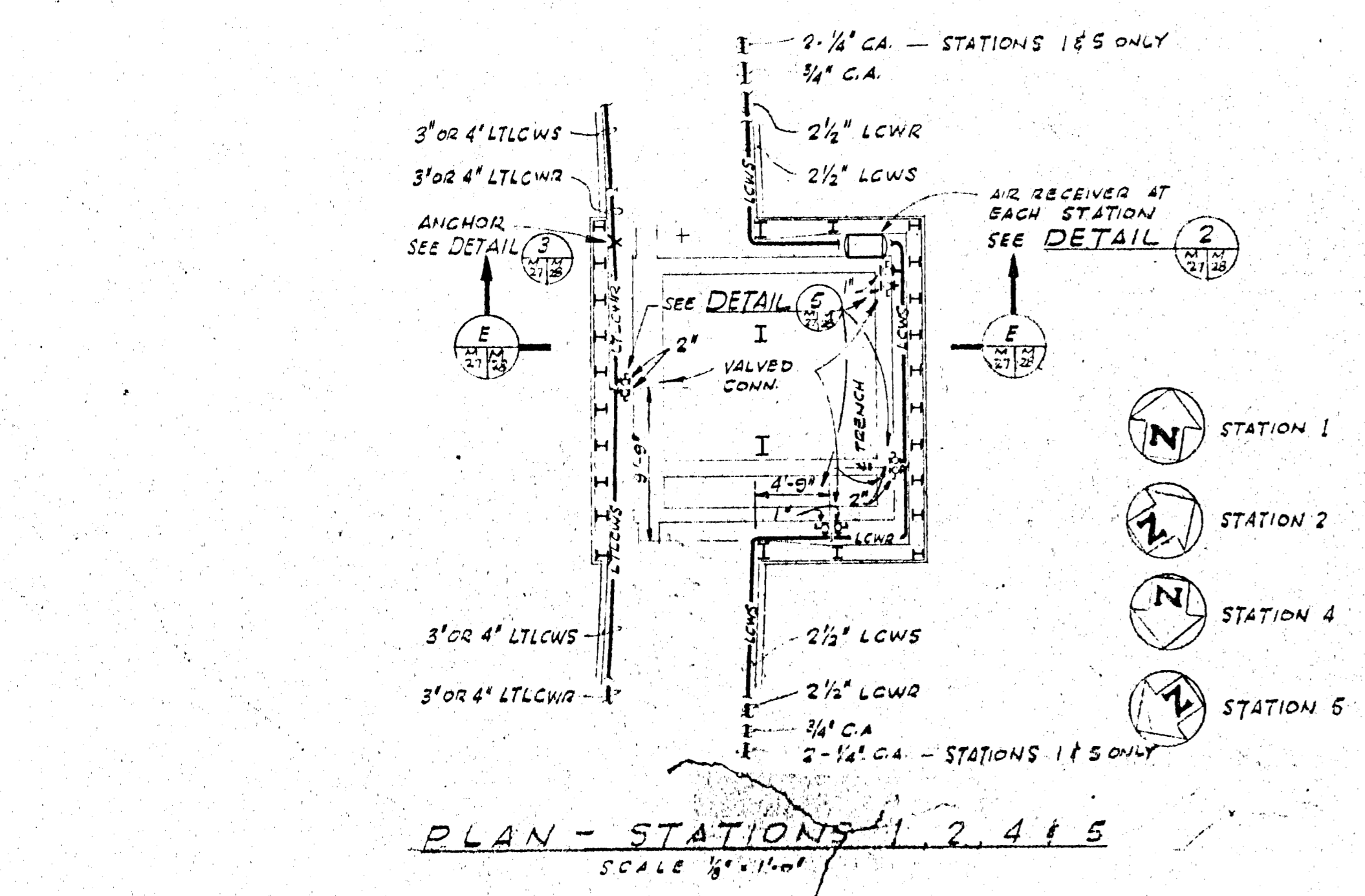
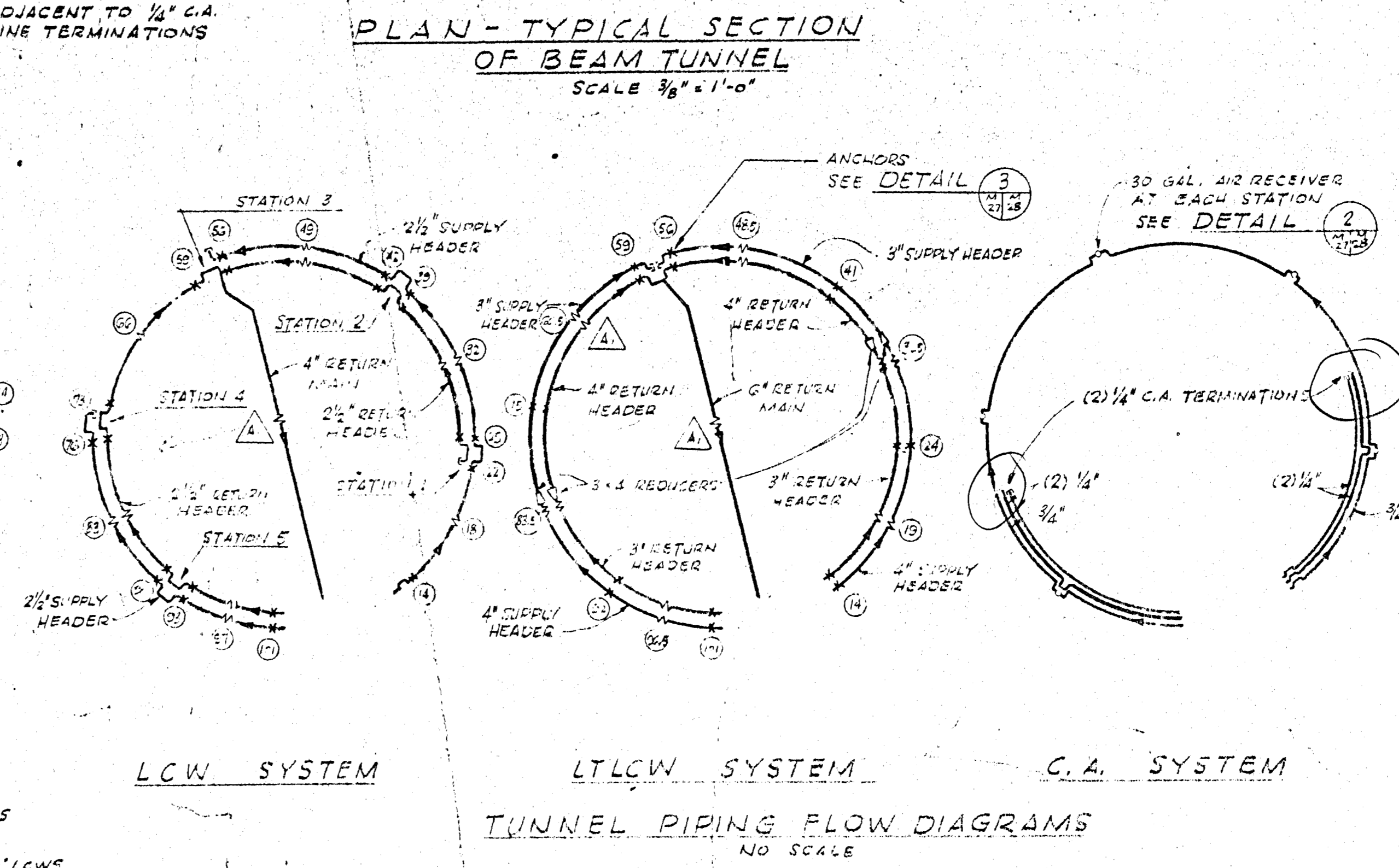
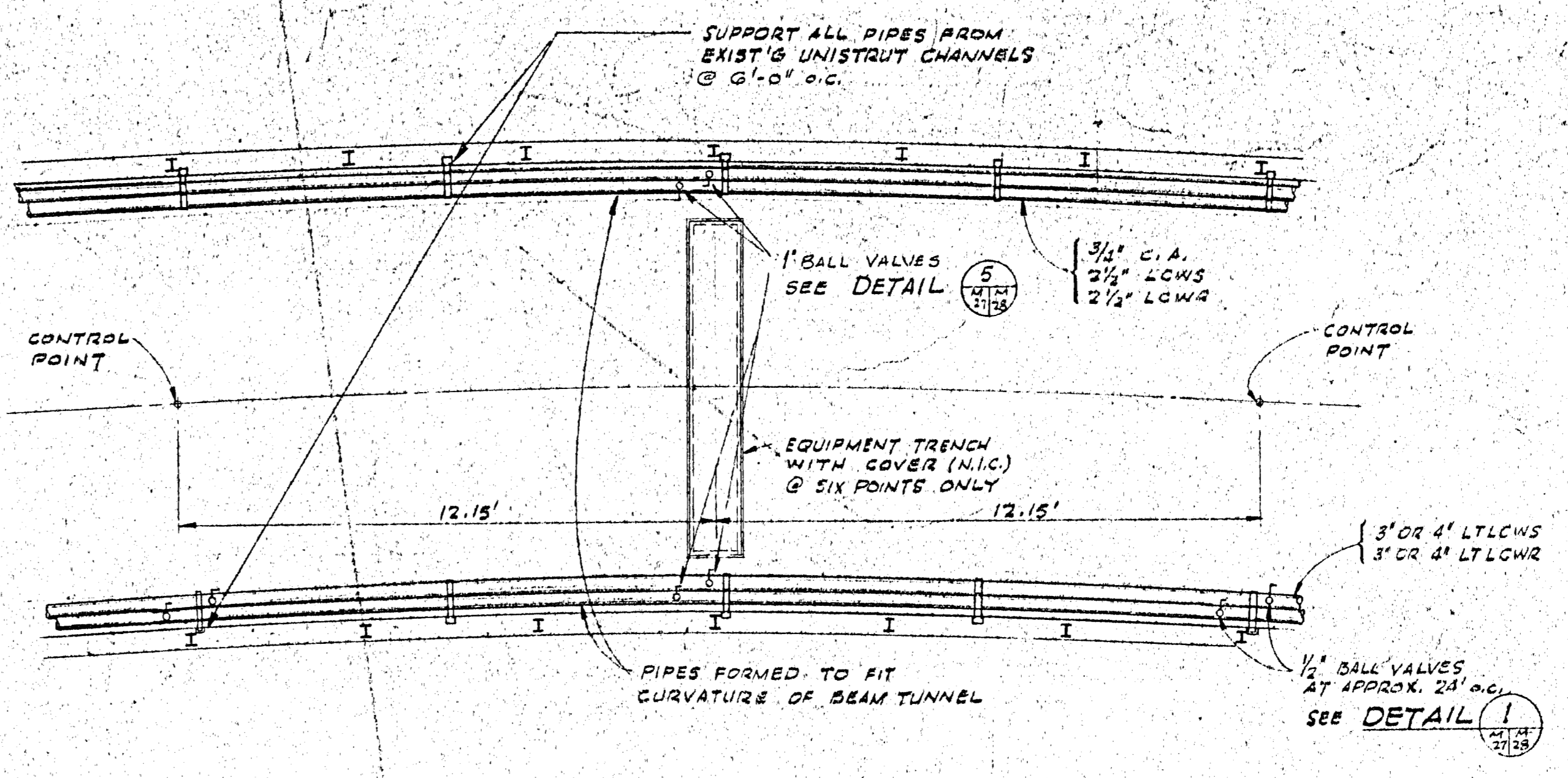
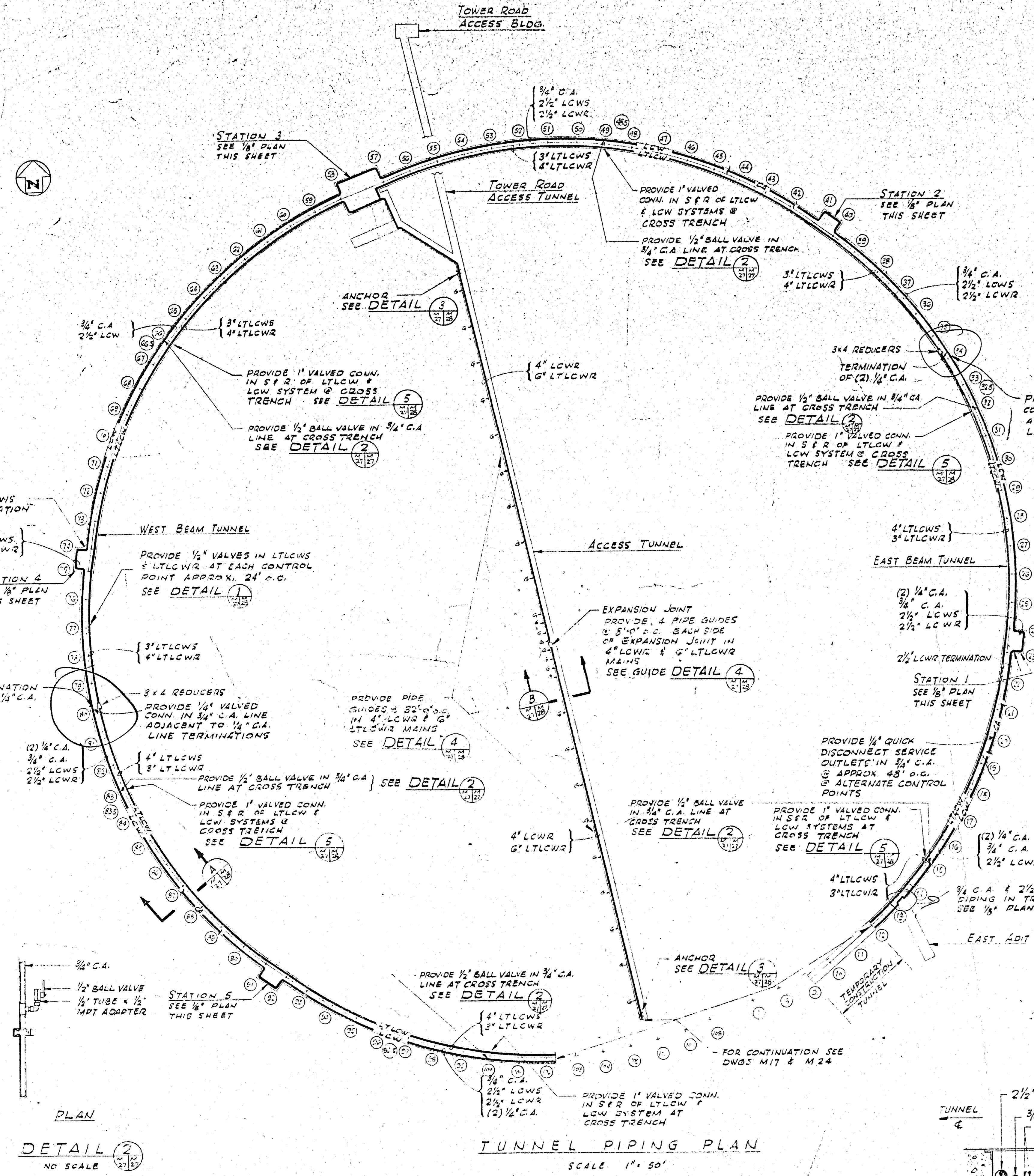
- LWS — LOW CONDUCTIVITY WATER SUPPLY
- LCWR — LOW CONDUCTIVITY WATER RETURN
- LTLWS — LOW TEMPERATURE LOW CONDUCTIVITY WATER SUPPLY
- LTLWR — LOW TEMPERATURE LOW CONDUCTIVITY WATER RETURN
- CA — COMPRESSED AIR
- BV — BALL VALVE
- GAP — GAP
- (2) — CONTROL POINT NUMBER
- O.C. — ON CENTERS
- N.I.C. — NOT IN CONTRACT
- S — SUPPLY
- R — RETURN
- G — GUIDES
- E — EXPANSION JOINT
- A — ANCHOR

EXPANSION JOINTS REQUIRED TRAVERSE

	EXTENSION	COMPRESSION	TRAVERSE
BEAM TUNNEL JOINTS	1 IN.	3 IN.	4 IN.
ACCESS TUNNEL JOINTS	2 IN.	5 IN.	7 IN.

GENERAL NOTES

1. EMBEDDED UNISTRUTS ARE 6" O.C. IN BEAM TUNNEL, 8" O.C. IN ACCESS TUNNEL & 8" O.C. ON SIDE WALLS OF STATIONS. USE FOR SUPPORTING MECHANICAL WORK.
2. SAN EPII CAPACITY SHOWN ON EPII SCHEDULE DWG. M11.



APPROVED FOR CONSTRUCTION

IO GEV CORNELL SYNCHROTRON LABORATORY
CORNELL UNIVERSITY ITHACA, NEW YORK

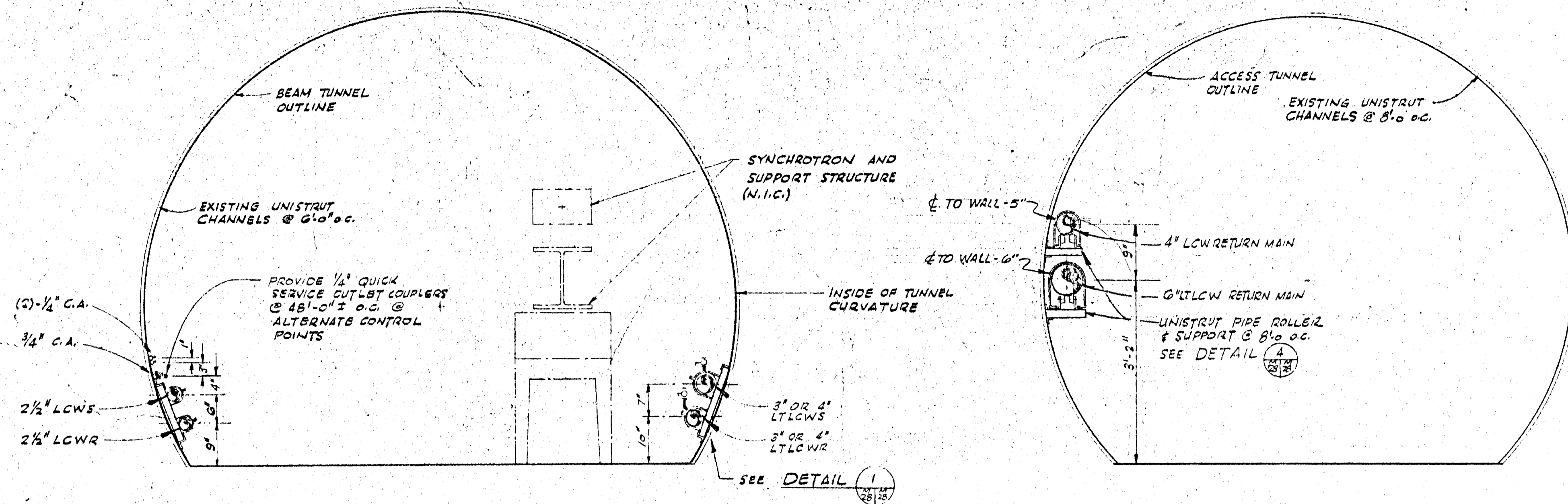
TUNNEL FINISHING WORK
SYNCHROTRON COOLING WATER & COMPRESSED AIR PIPING PLANS & FLOW DIAGRAMS

WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT

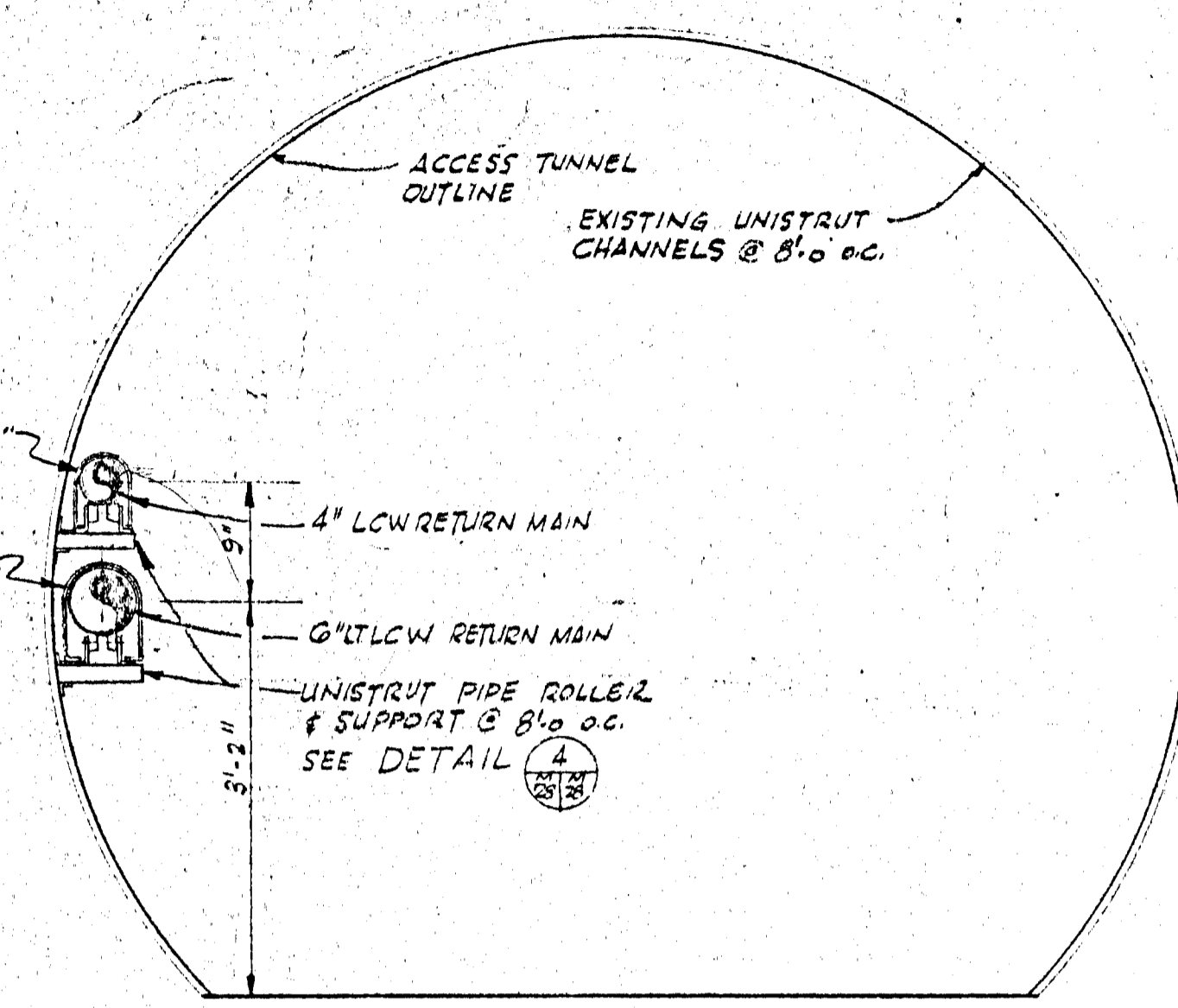
980 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-524-8844

DR. ROBECK CHK. [Signature] SUPPLY [Signature] SCALE NOTED

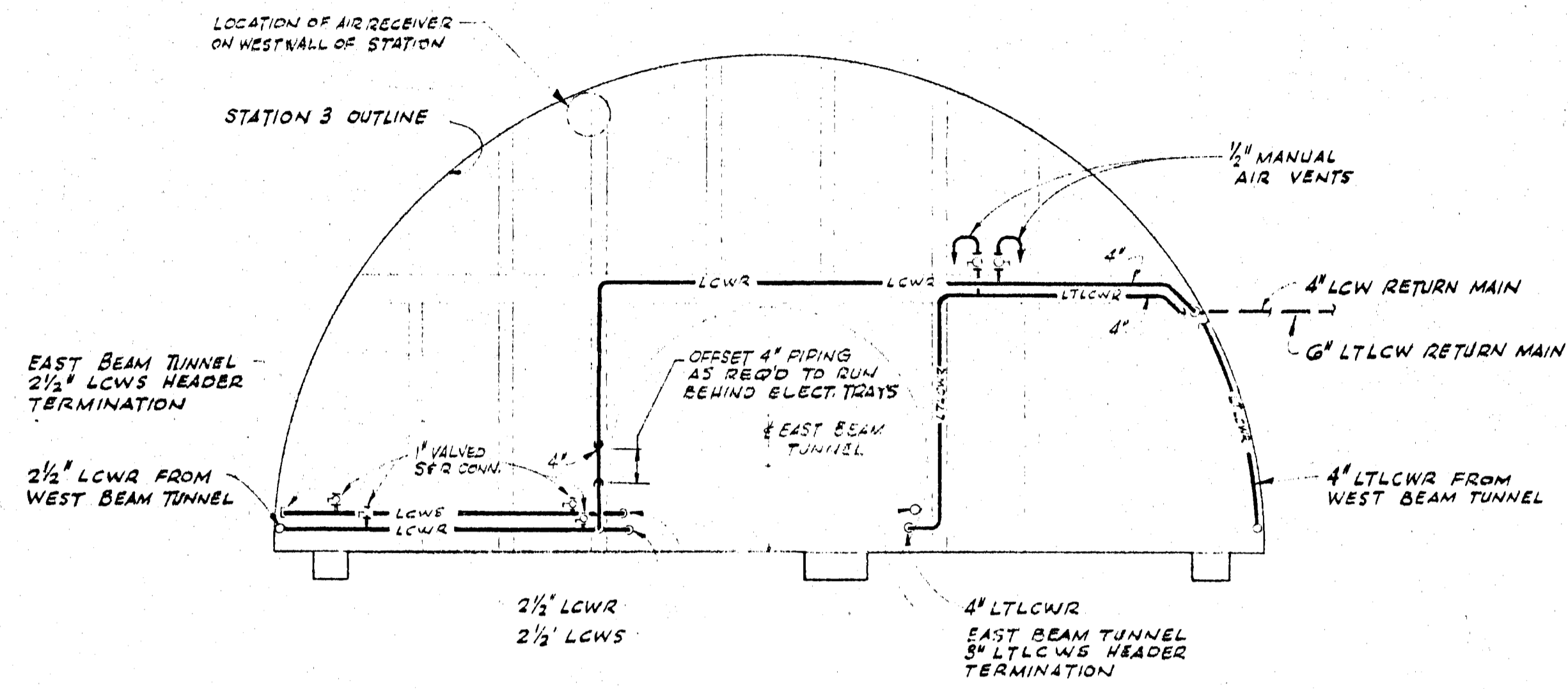
RELEASED	APPROVED	SHEET 73 OF 102
LAB NUCLEAR STUDIES	VP-BUSINESS	DRAWING NO. M27
DATE: 1 NOV 15 1965	DATE: JAN 15 1966	WMB & A NO. 1115



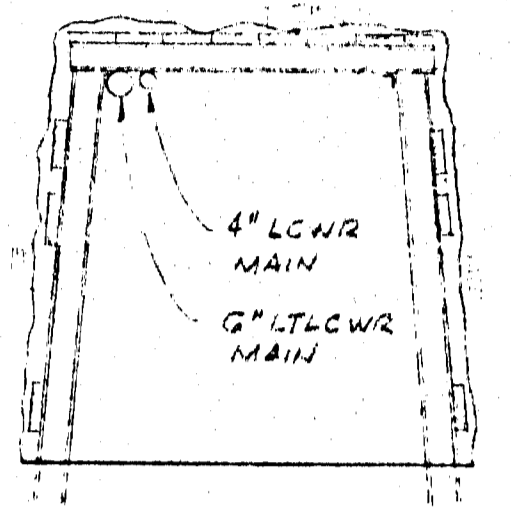
SECTION A
SCALE 3/4" = 1'-0"
(TYPICAL BEAM TUNNEL SECTION)



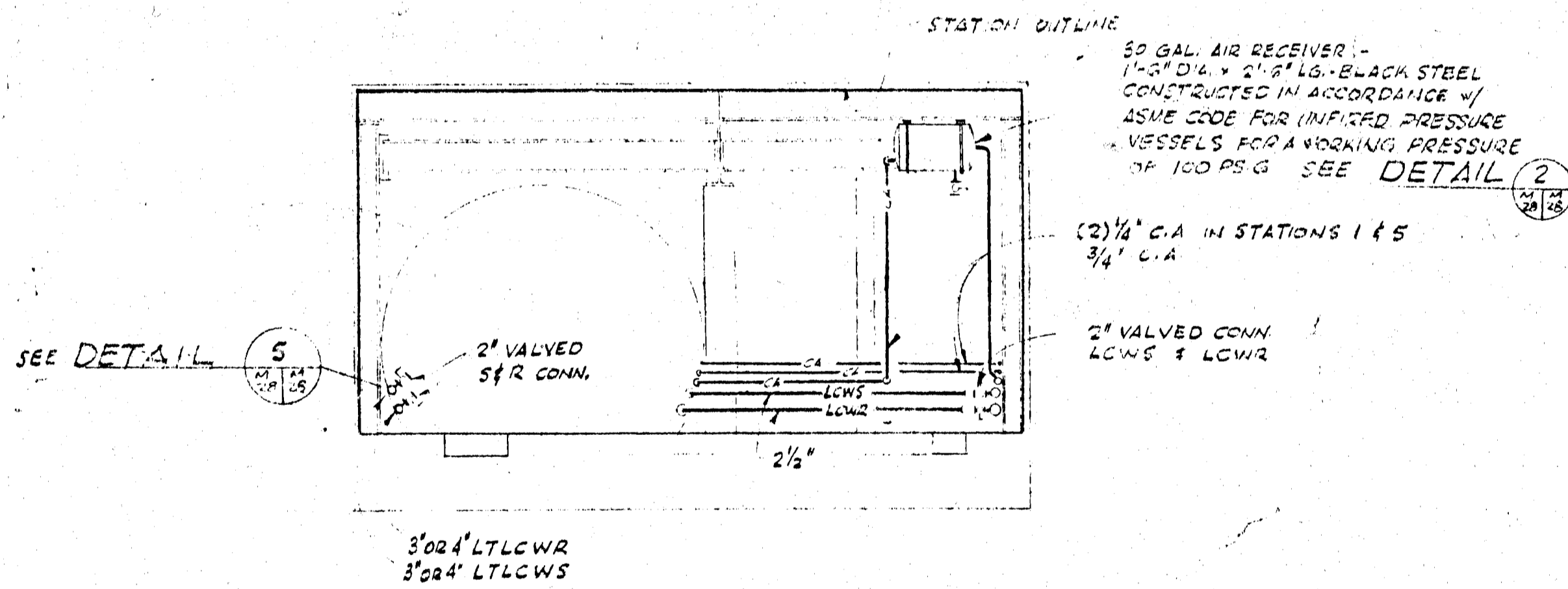
SECTION B
SCALE 3/4" = 1'-0"
ACCESS TUNNEL



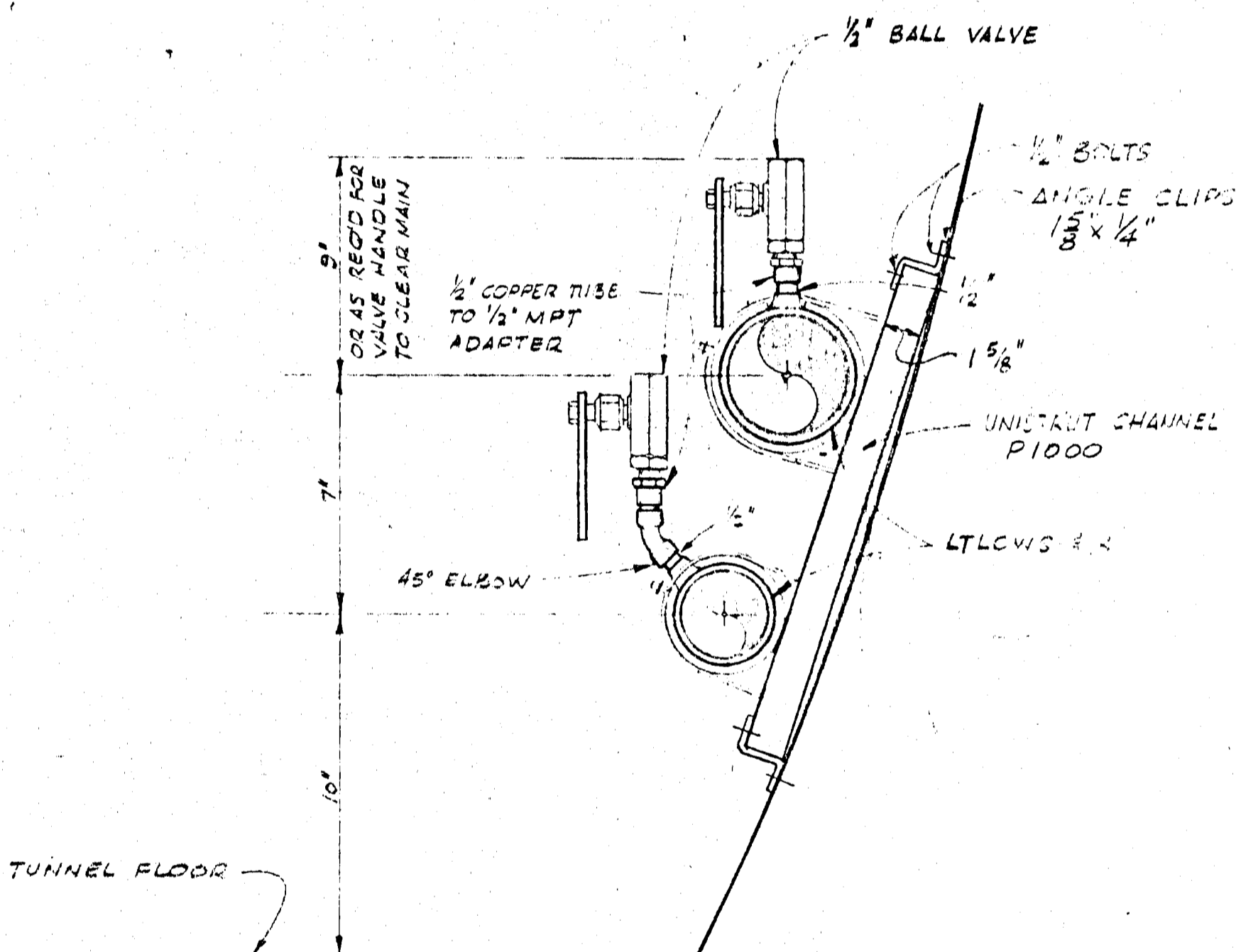
SECTION C
SCALE 1/2" = 1'-0"
STATION 3 OUTLINE



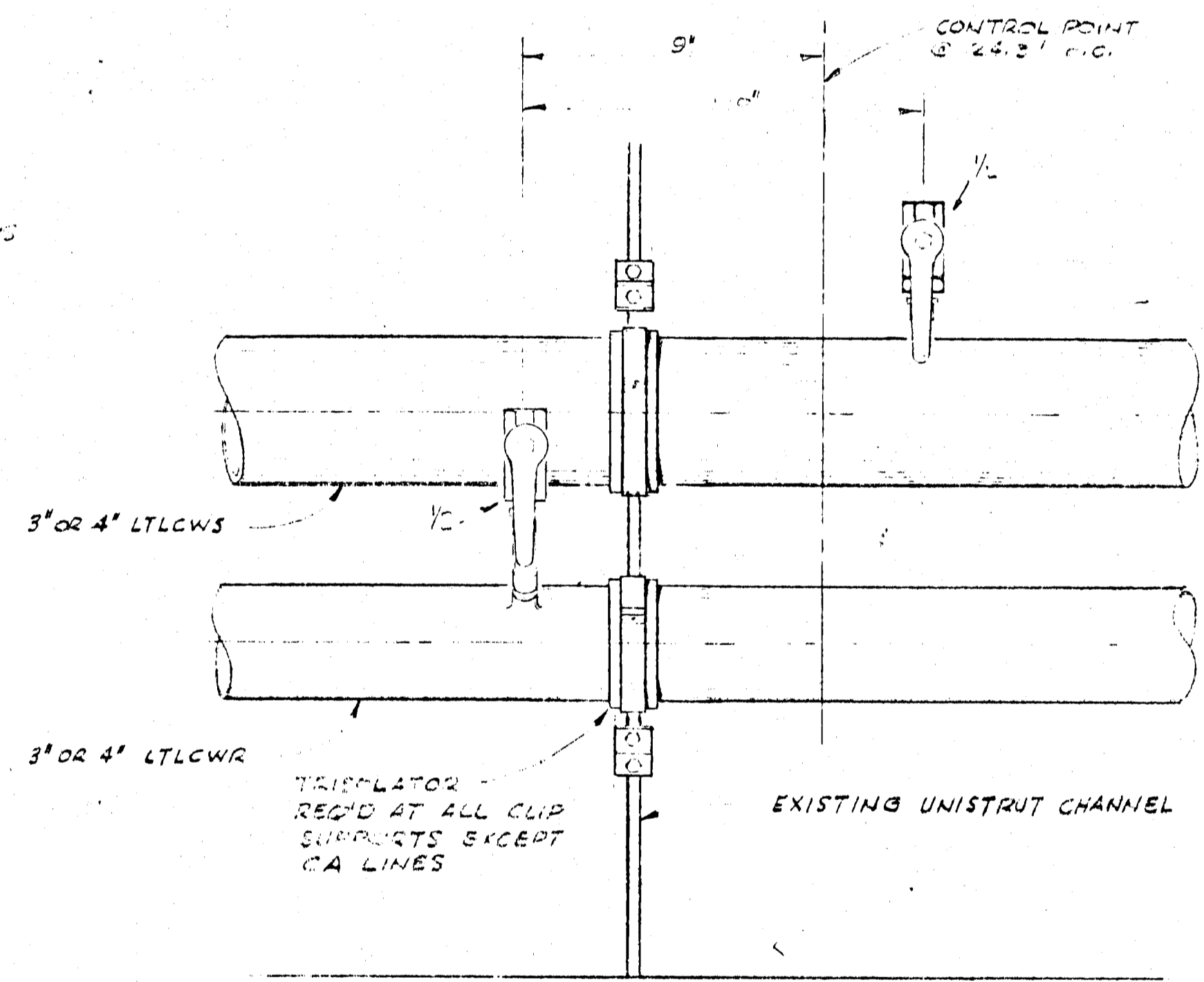
SECTION D
SCALE 1/2" = 1'-0"



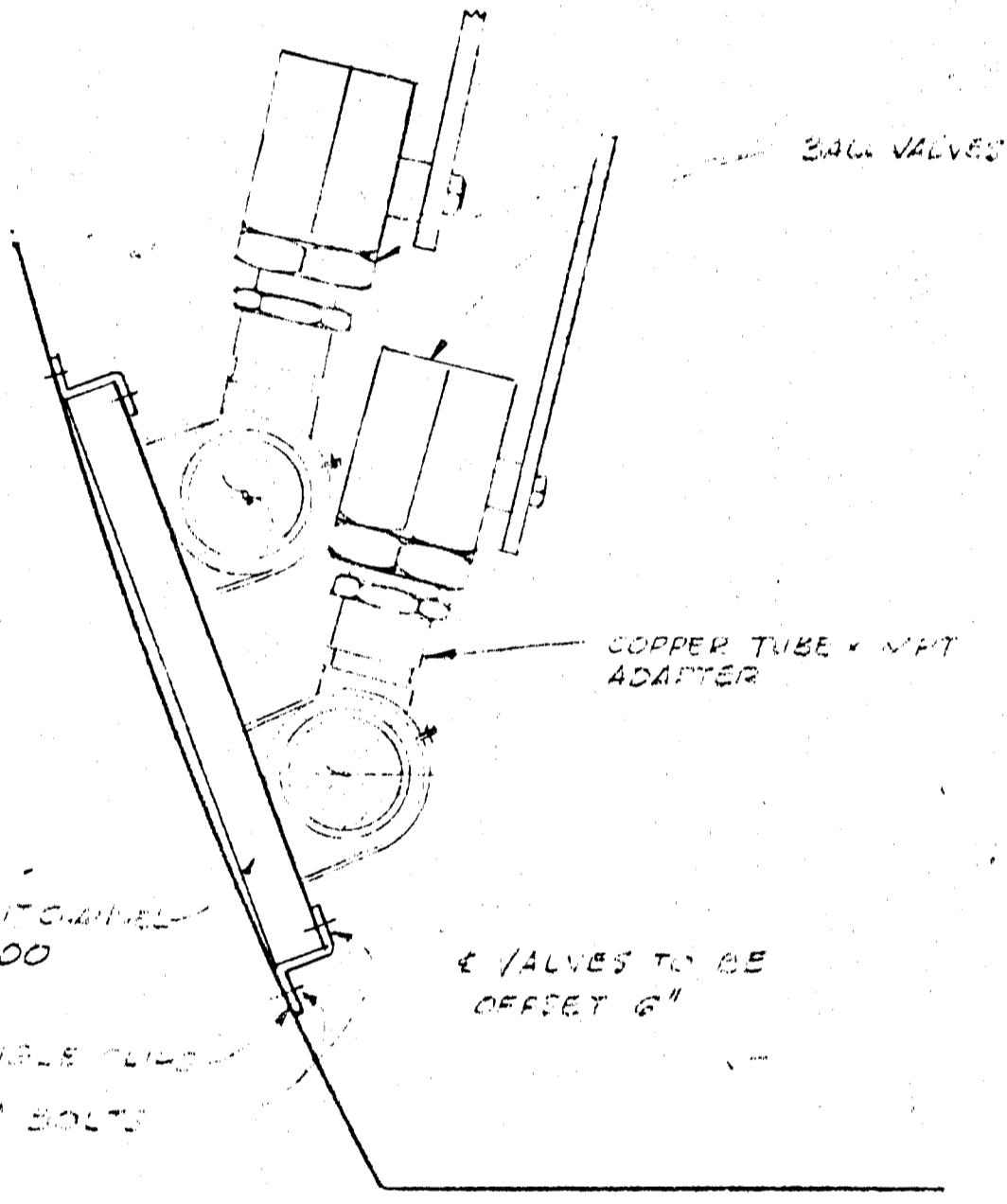
SECTION E
SCALE 1/2" = 1'-0"
TYPICAL BEAM TUNNEL SECTION



SECTION F
SCALE 3" = 1'-0"
TYPICAL LTLCW SERVICE OUTLET CONNECTION DETAIL



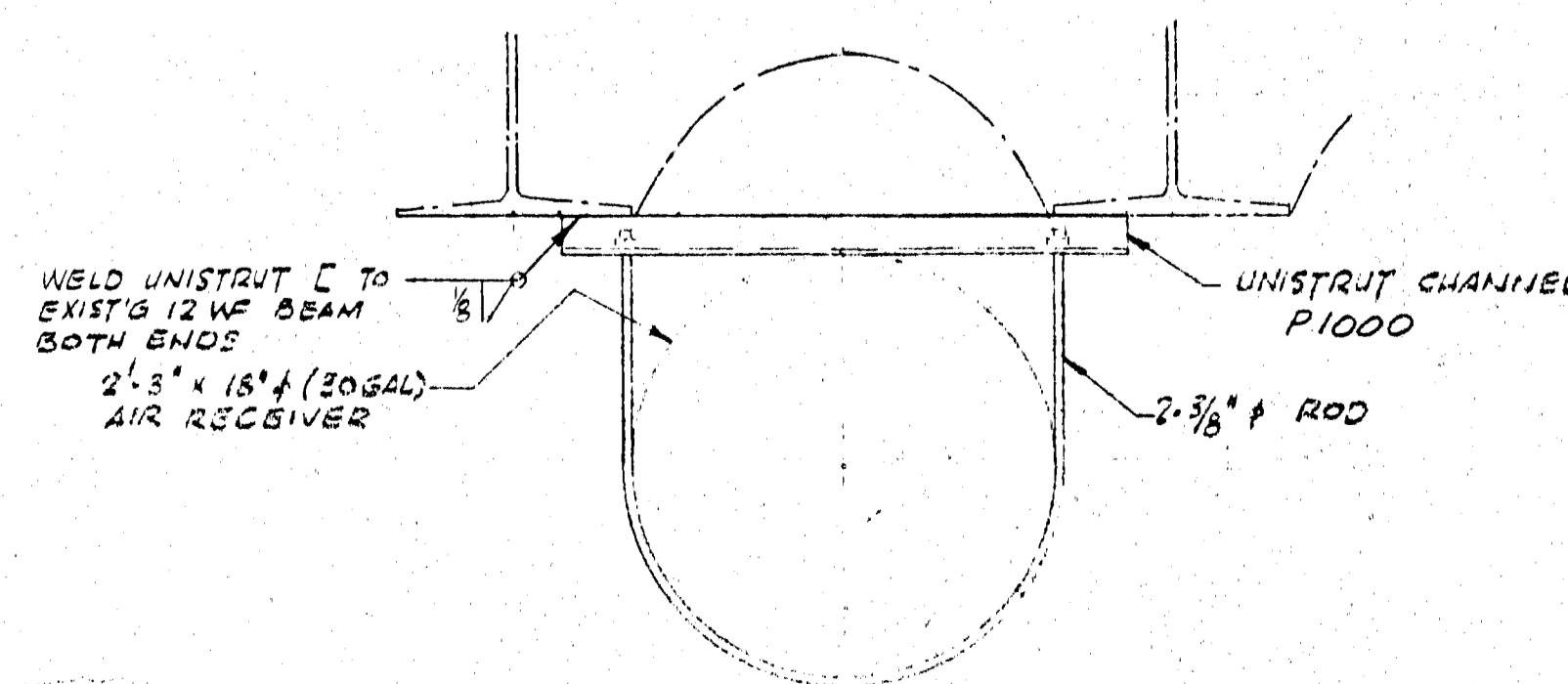
ELEVATION
SCALE 3" = 1'-0"
TYPICAL PIPE ANCHOR DETAIL



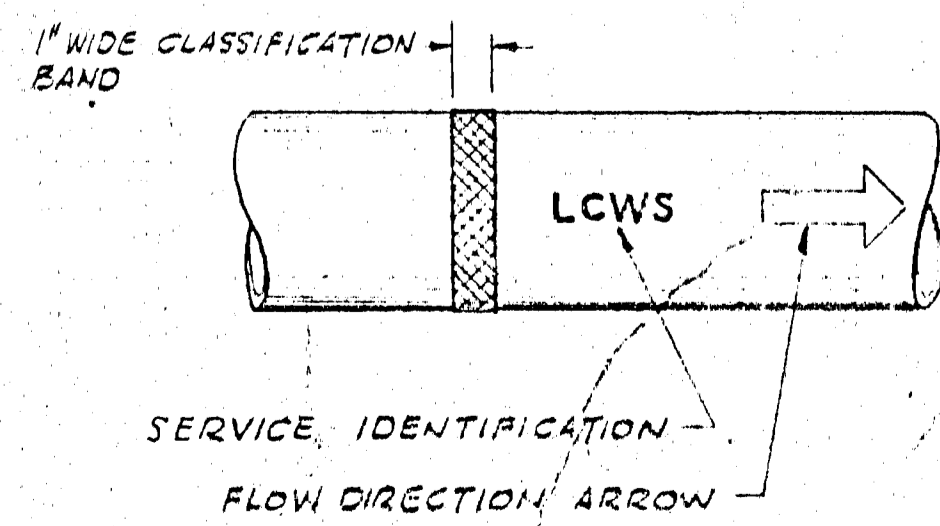
DETAIL G
NO SCALE
TYPICAL PIPE ANCHOR DETAIL
1/2" VALVES TO BE OFFSET 6"

APPROVED FOR CONSTRUCTION

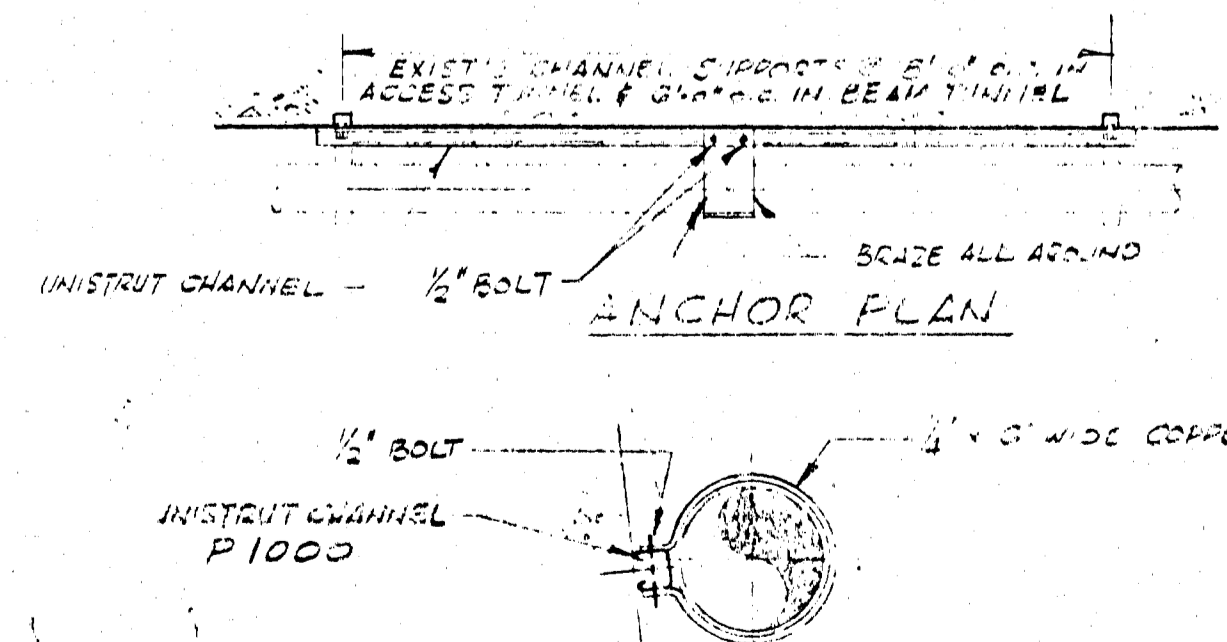
NOTE
FOR LEGEND REFER TO DWG M-27



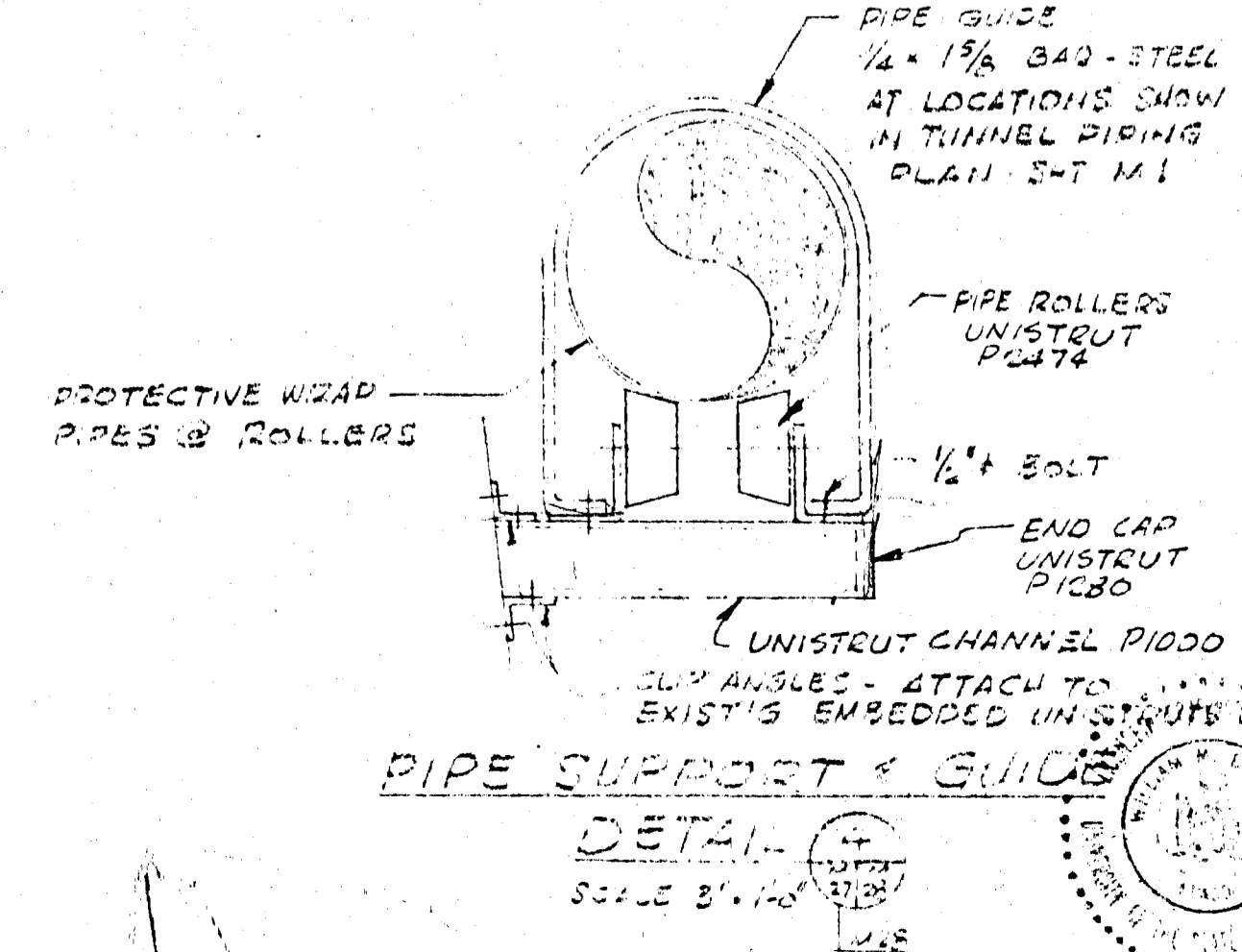
TANK SUPPORT DETAIL
SCALE 1 1/2" = 1'-0"



PIPING IDENTIFICATION DETAIL



SECTION
TYPICAL
PIPE ANCHOR DETAIL
SCALE 3" = 1'-0"



PIPE SUPPORT & GUIDE
DETAIL
SCALE 3" = 1'-0"

LTR	REVISIONS	DATE	CHKD	APPD

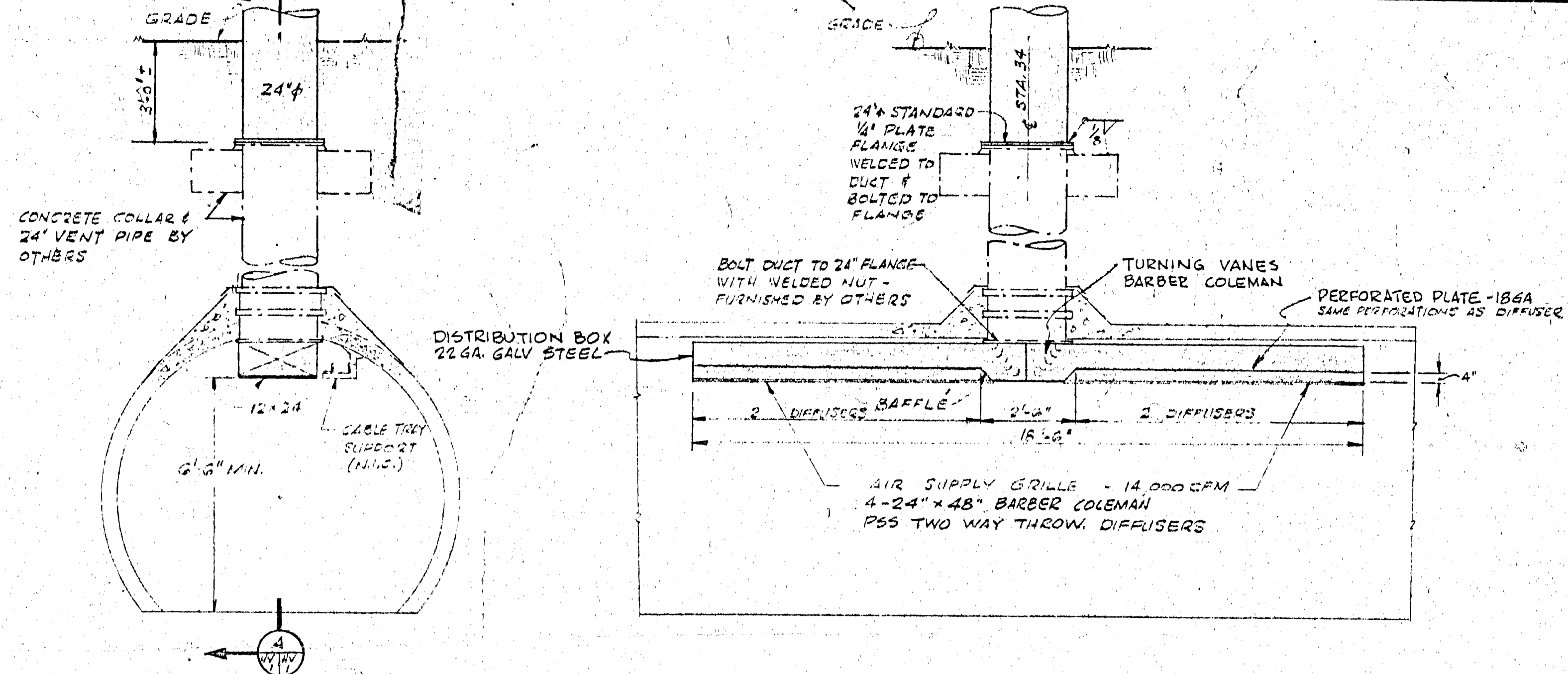
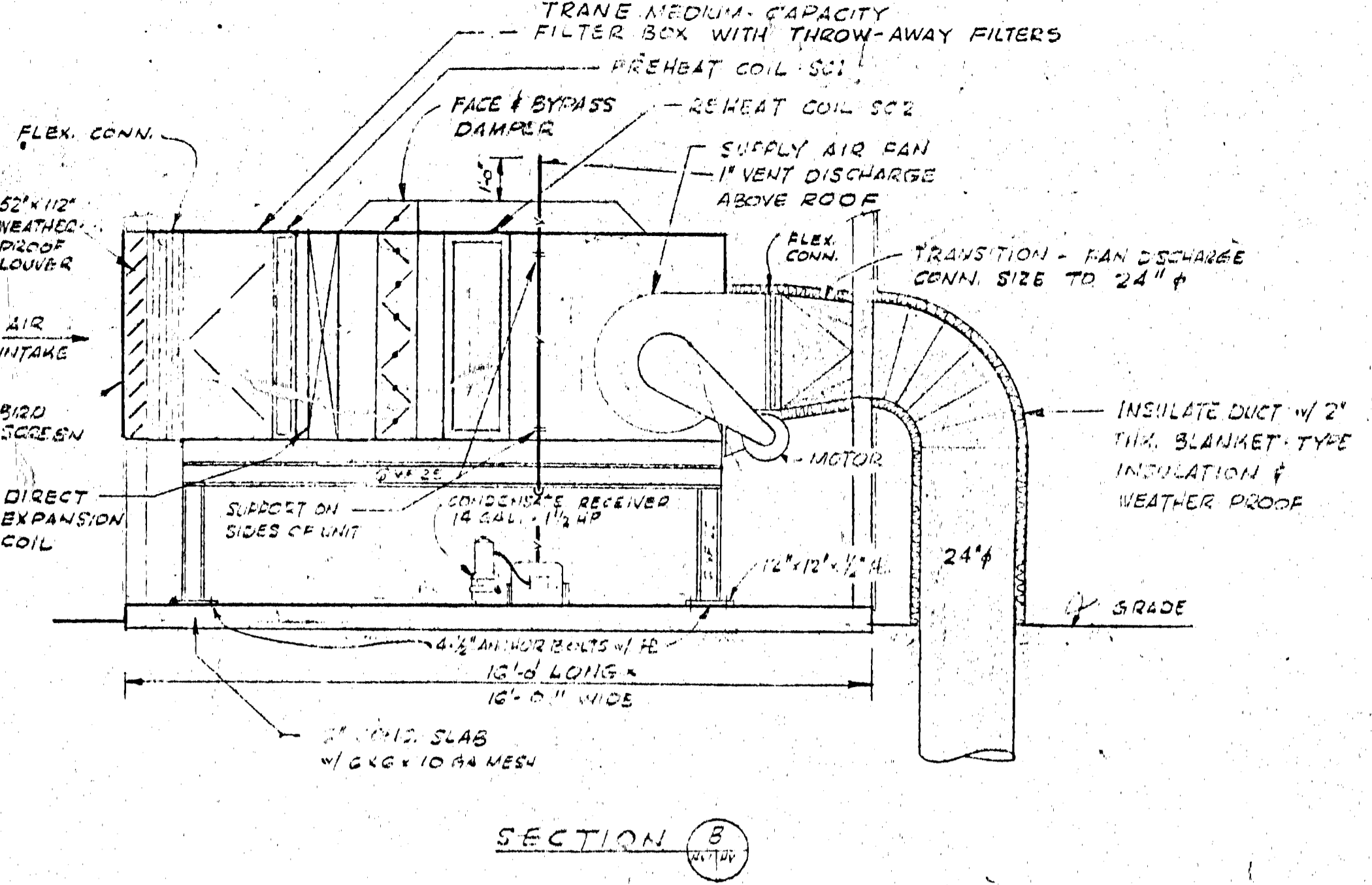
IO GEV CORNELL SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA NEW YORK

TUNNEL FINISHING WORK
SYNCHROTRON COOLING WATER & COMPRESSED AIR PIPING SECTIONS & DETAILS

WILLIAM M. BROBECK AND ASSOCIATE
IAN MACKINLAY, AIA ARCHITECT

950 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 415-824-8867

DR. APPROVED	CHKD. APPROVED	SUPR. APPROVED
RELEASED	APPROVED	
LAB NUCLEAR STUDIES		
DATE NOV. 18, 1972		DATE JAN. 12, 1974



EQUIPMENT SCHEDULE

FANS

NO.	SERVICE	CAPACITY		FAN SPEED RPM	TIP SPEED RPM	MOTOR HP	TYPE	MANUFACTURER & MODEL NO.
		CFM	IN. W.G.					
TAH-1	TUNNEL AIR SUPPLY	14,000	3 1/2	1200	8,500	15	AIR HANDLER WITH AIRBOL FAN	TRANE PE 25 CLIMATE CHANGER
TEF-1	ACCESS TUNNEL EXHAUST	5000	1/2	1700	8100	3/4	DIRECT DRIVE PROPELLER	TRANE CD 20
TEF-2	EAST BEAM TUNNEL EXHAUST	5000	1/2	1100	7000	1	BELT DRIVE PROPELLER	TRANE PE 25 TYPE B WHEEL
TEF-3	WEST BEAM TUNNEL EXHAUST	5000	1/2	1100	7000	1	BELT DRIVE PROPELLER	TRANE PE 25 TYPE C WHEEL

STEAM COILS

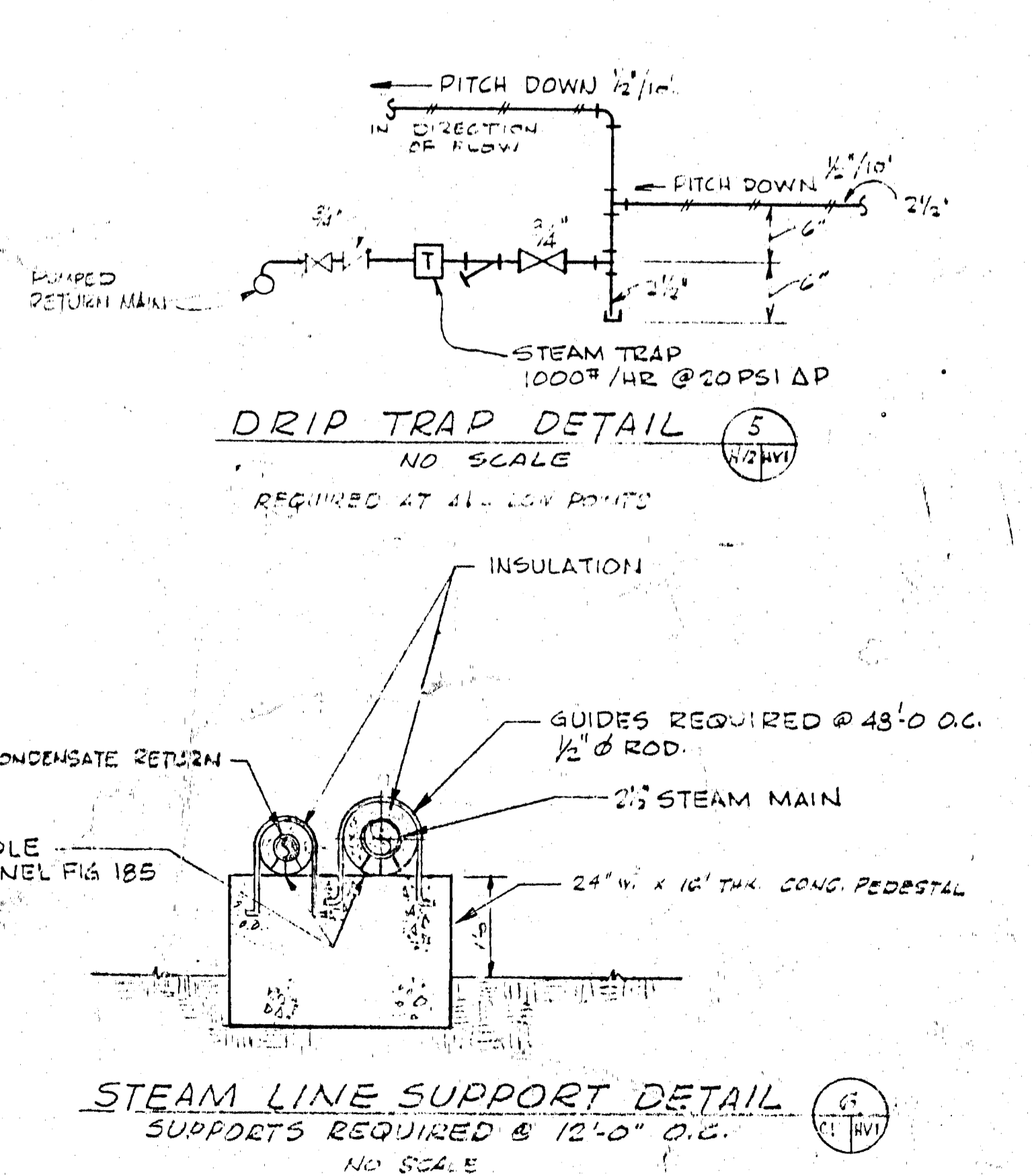
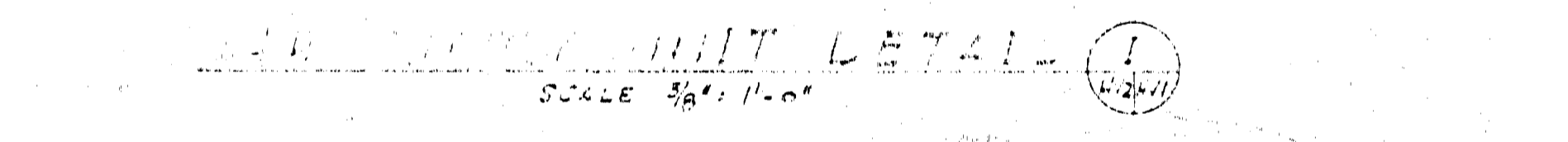
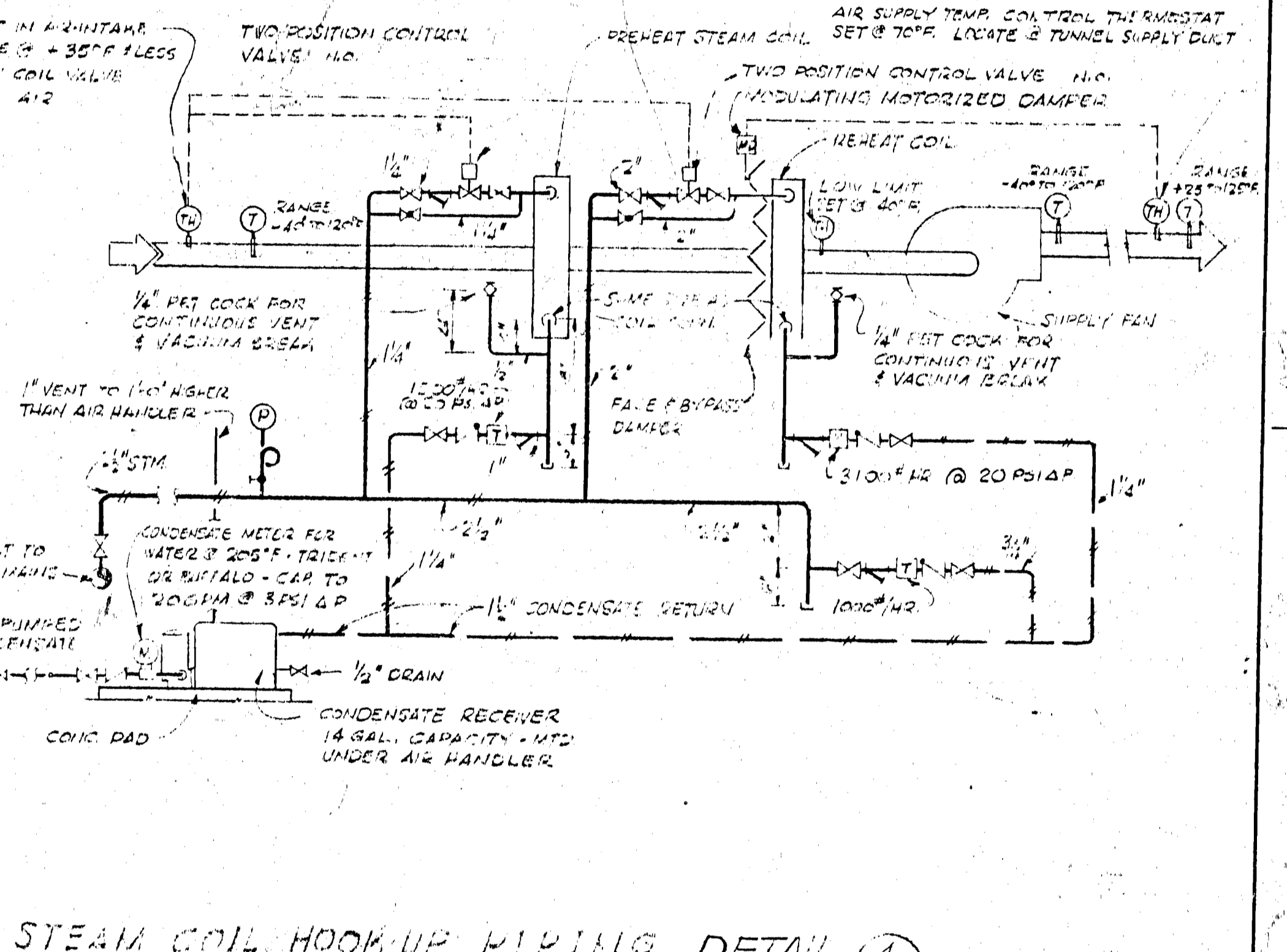
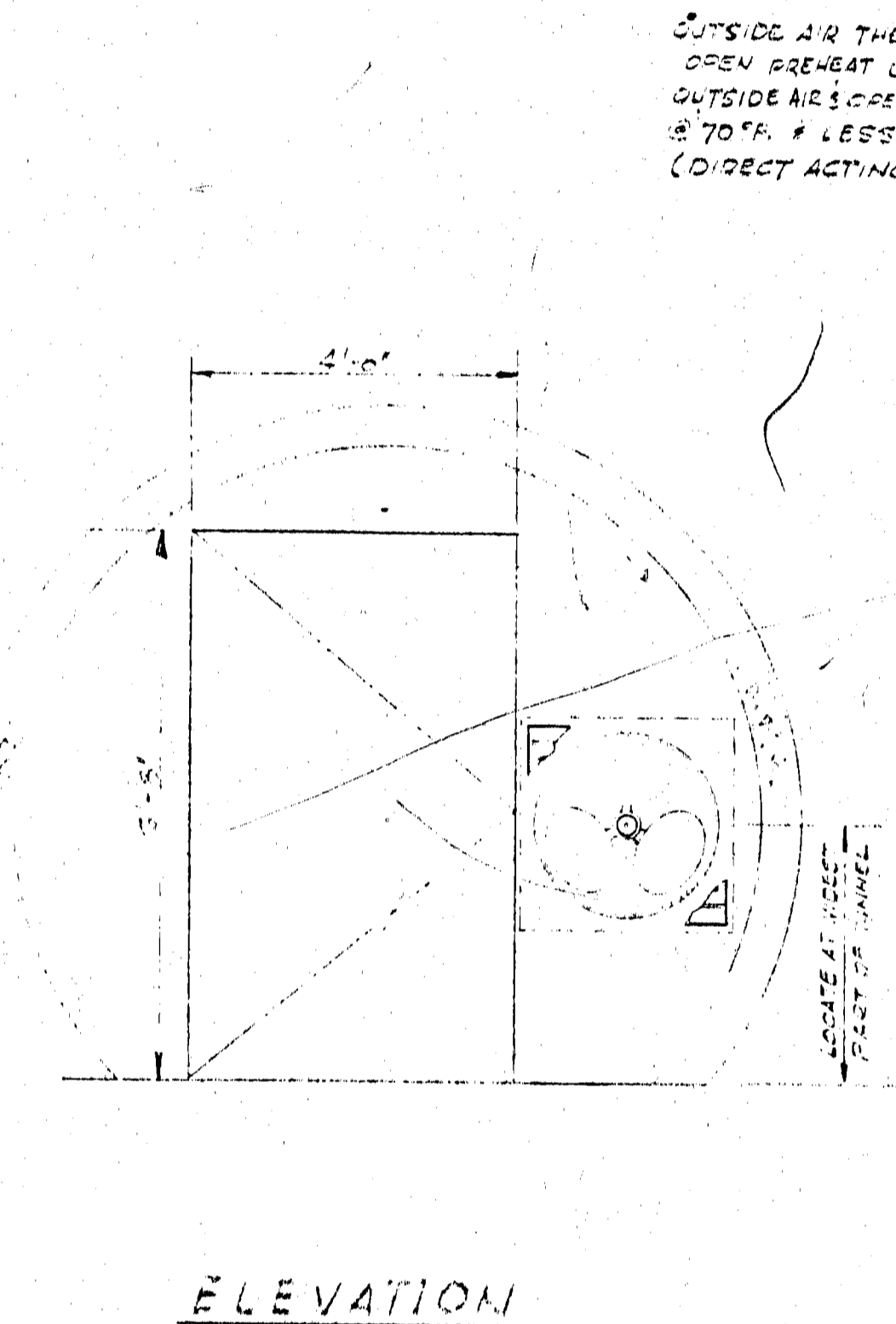
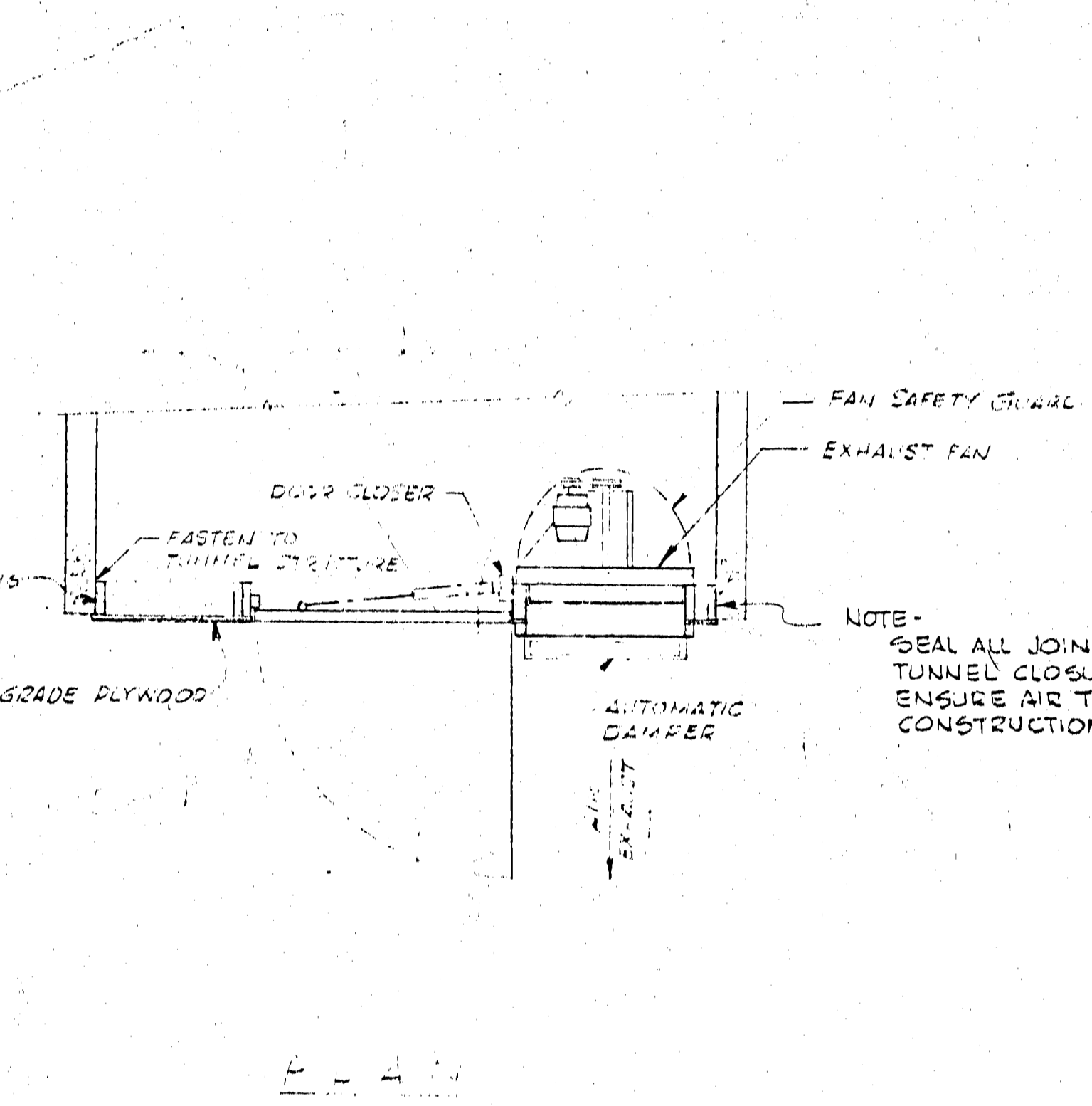
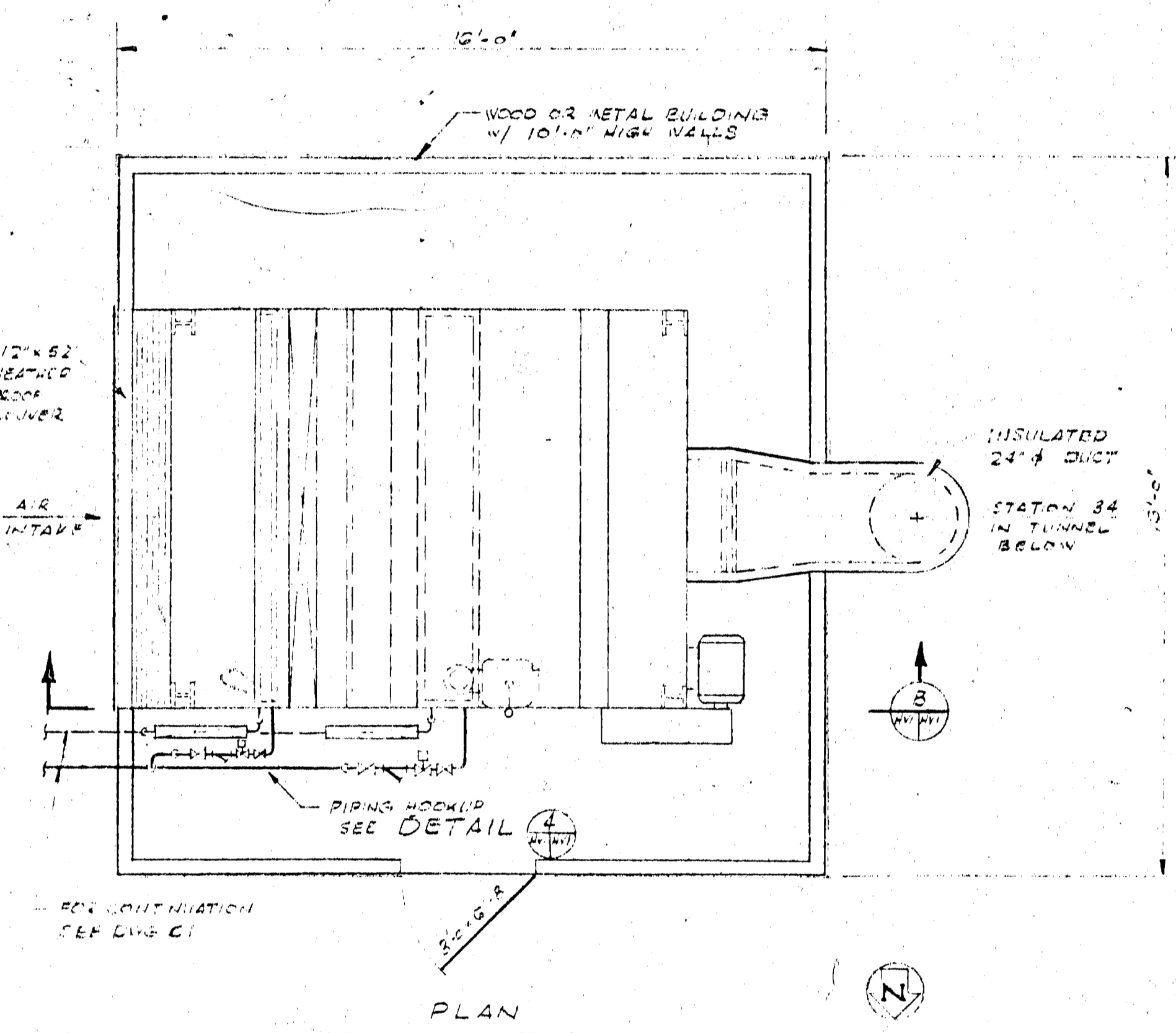
NO.	SERVICE	CAPACITY STG/HRS	AT 115		FACE VEL. FPM	STEAM PRESS. PSIG	CONDUIT SIZE IN.	TYPICAL THERM. CAPACITY
			VELOCITY CFM	TEMP. DEG. F				
SC1	PREHEAT	450,000	14,000	-10	410	4.00	0.25 W.G.	80' 500' 500' 1000'
SC2	REHEAT	1,350,000	14,000	+20	410	4.00	0.25 W.G.	80' 1000' 1500' 2000'

CONDENSATE RETURN PUMP

8000 GPD 1/2 GPM'S/45 PSIG 1/2 GALLON RECEIVER 1 1/2 HP MOTOR 60/50 2\"/>

DIRECT EXPANSION COIL

AIR VOLUME CFM	CAPACITY BTU/HRS	ENT. AIR		LVE. AIR		TEMPERATURE DEG. F	AIR FLOW IN. W.G.	COIL FACE VELOCITY FPM
		D.B.	W.B.	D.B.	W.B.			
14,000	735,000	95°F	75°F	75°F	60°F	45°F	1/2 W.G.	400



GENERAL NOTES

- FOR LOCATION OF TEMPORARY HEATING & VENTILATING EQUIPMENT SEE DRAWING H-2.
- ON COIL CONNECTIONS SHALL BE CAPED.

MATERIAL SPECIFICATION

PIPE
STEAM - BLACK STEEL SCHEDULE 40
CONDENSATE - BLACK SCHEDULE 40
120MM SCHEDULE 40

FITTINGS
2\"/>

LEGEND

- STEAM SUPPLY - 100 PSIG
- RAMPED CONDENSATE RETURN
- GRAVITY CONDENSATE RETURN
- GATE VALVE
- GLOBE VALVE
- CHECK VALVE
- STRAINER
- STEAM TRAP
- C&P
- THERMOMETER - 3/8\"/>
- THERMISTAT
- PRESSURE GAUGE, 500MM RANGE 0 TO 30 PSIG - 1/2\"/>
- NO NORMALLY OPEN
- TAH TEMPORARY AIR HANDLER
- TEF TEMPORARY EXHAUST FAN

APPROVED FOR CONSTRUCTION

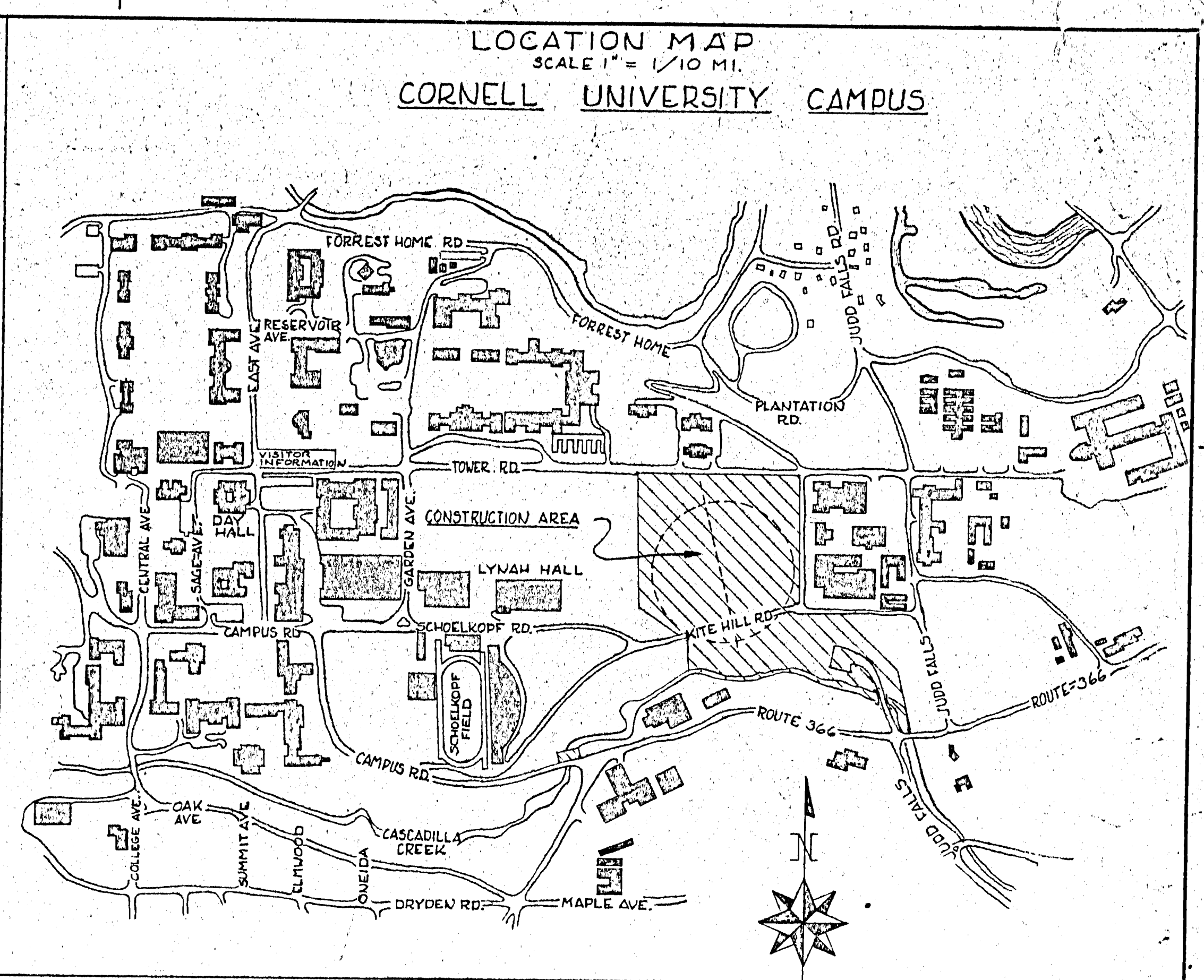
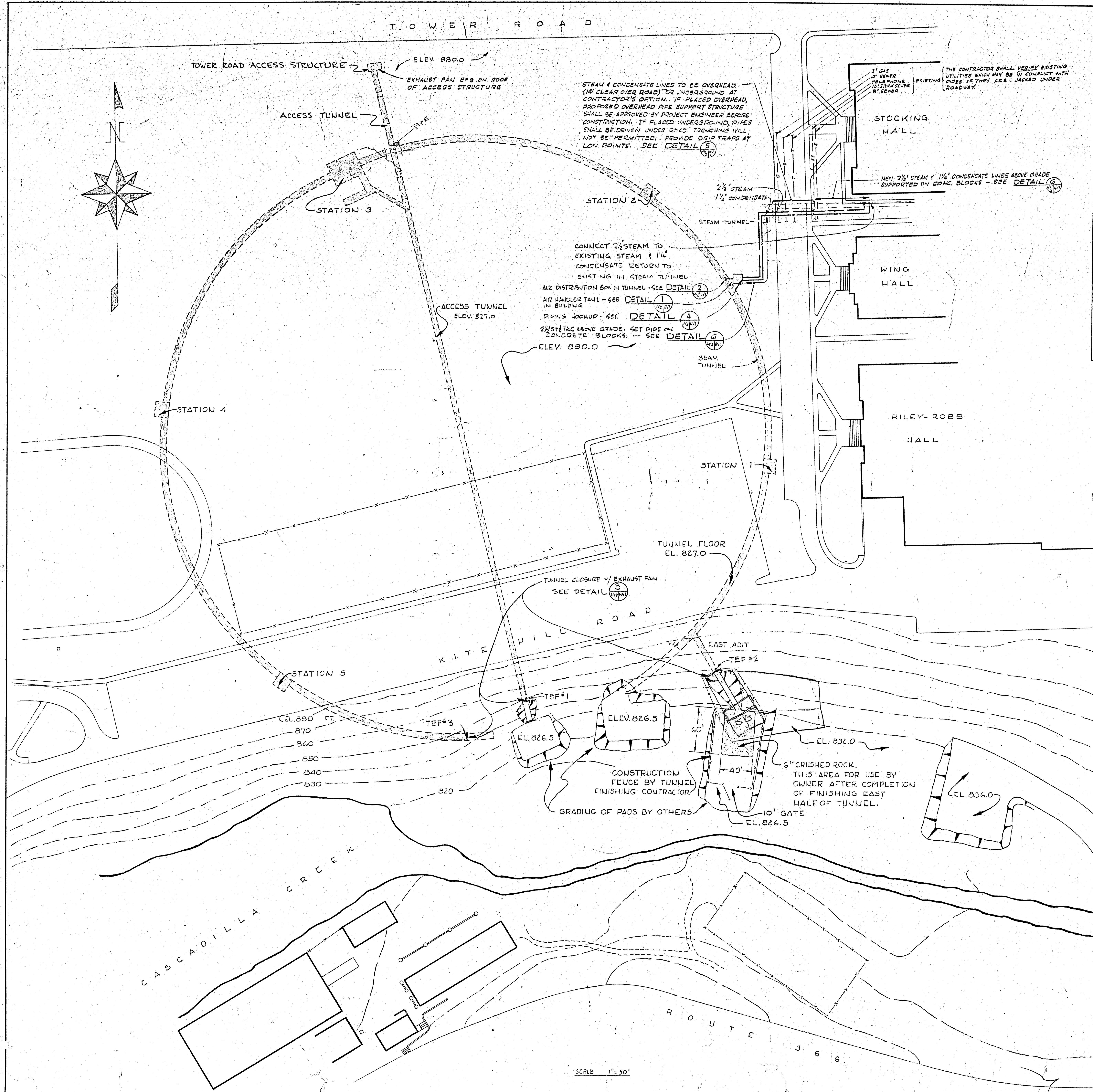
IO GEV CORNELL SYNCHROTRON LABORATORY
CORNELL UNIVERSITY
ITHACA, NEW YORK

TUNNEL FINISHING WORK
TEMPORARY HEATING & VENTILATING SYSTEM

WILLIAM M. BROBECK AND ASSOCIATES
IAN MACKINLAY, AIA ARCHITECT
PREGONOFF & MATHIEU STRUCTURAL ENGR.
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750 GILMAN ST. BERKELEY, CALIF. 94710
TELEPHONE 515-524-8664

DR. PREGONOFF: CHR. PREGONOFF	DATE: 10/15/88	SCALE: AS SHOWN
RELEASED	APPROVED	DATE: 10/15/88
LAB NUCLEAR S/D/ISS		4E 15
DRAWING NO. HVI		WMB & A NO. 11-15

Edward M. Mackinlay
10/15/88



STEAM PIPING AND HEATING & VENTILATING EQUIPMENT SHOWN ON THIS DRAWING SHALL BE INCLUDED WITH BID ALTERNATE # 9

GENERAL NOTES
1. FOR HEATING & VENTILATING EQUIPMENT & LEGEND SEE M.I.

APPROVED FOR CONSTRUCTION

LTR	REVISIONS	DATE	CHK'D	APP'D
IO GEV CORNELL SYNCHROTRON LABORATORY CORNELL UNIVERSITY ITHACA, NEW YORK				
TUNNEL FINISHING WORK				
LOCATION MAP AND SITE PLAN				
WILLIAM M. BROBECK AND ASSOCIATES IAN MACKINLAY, AIA ARCHITECT				
950 GILMAN ST. TELEPHONE		BERKELEY, CALIF. 94710 415 - 824 - 8664		
DR. J. P. W.	CHK. B. H.	SUPV. F. C.	SCALE AS NOTED	
RELEASED	APPROVED	SHEET 45		OF 172
LAB NUCLEAR STUDIES		DRAWING NO. HVP		
DATE MAY 15, 1972		DATE JAN 15, 1966		WMB & A

SCALE 1" = 50'