

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No:	05-1555	Issue Date:	NOV 7 2005	CBL:	293 A001001
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Location of Construction: 30 Warren Ave	Owner Name: Salvation Army The	Owner Address: 440 West Nyack Rd	Phone:
Business Name:	Contractor Name: Avery Services, Inc.	Contractor Address: 7 Thomas Drive Westbrook	Phone: 2077728687
Lessee/Buyer's Name	Phone:	Permit Type: HVAC	Zone: B-4

Past Use: Salvation Army	Proposed Use: Install Direct vent gas hanging unit <i>6</i> <i>of rooftop unit</i>	Permit Fee: \$381.00	Cost of Work: \$39,989.00	CEO District: 5
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Proposed Project Description: Install Direct vent gas hanging unit <i>6</i> <i>of rooftop unit</i>	FIRE DEPT: <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied <i>TO NFPA 54</i>	INSPECTION: Use Group: <i>B</i> Type: <i>HVAC</i>
	Signature: <i>Greg Cass</i>	Signature: <i>AMB 11/7/05</i>

Permit Taken By: GG	Date Applied For: 10/24/2005	Zoning Approval	
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<p>1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.</p> <p>2. Building permits do not include plumbing, septic or electrical work.</p> <p>3. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..</p>	<p>Special Zone or Reviews</p> <p><input type="checkbox"/> Shoreland</p> <p><input type="checkbox"/> Wetland</p> <p><input type="checkbox"/> Flood Zone <i>ok</i></p> <p><input type="checkbox"/> Subdivision</p> <p><input type="checkbox"/> Site Plan</p> <p>Maj <input type="checkbox"/> Minor <input type="checkbox"/> MM <input type="checkbox"/></p> <p>Date: <i>AMB 10/24/05</i></p>	<p>Zoning Appeal</p> <p><input type="checkbox"/> Variance</p> <p><input type="checkbox"/> Miscellaneous</p> <p><input type="checkbox"/> Conditional Use</p> <p><input type="checkbox"/> Interpretation</p> <p><input type="checkbox"/> Approved</p> <p><input type="checkbox"/> Denied</p> <p>Date:</p>	<p>Historic Preservation</p> <p><input checked="" type="checkbox"/> Not in District or Landmark</p> <p><input type="checkbox"/> Does Not Require Review</p> <p><input type="checkbox"/> Requires Review</p> <p><input type="checkbox"/> Approved</p> <p><input type="checkbox"/> Approved w/Conditions</p> <p><input type="checkbox"/> Denied</p> <p>Date: <i>AMB</i></p>
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CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE

City of Portland, Maine - Building or Use Permit

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No: 05-1555	Date Applied For: 1012412005	CBL: 293 A001001
Location of Construction: 30 Warren Ave	Owner Name: Salvation Army The	Owner Address: 440 West Nyack Rd
Business Name:	Contractor Name: Avery Services, Inc.	Contractor Address: 7 Thomas Drive Westbrook
Licensee/Buyer's Name	Phone:	Permit Type: HVAC

Phone:
Phone
(207) 772-8687

Dept: Zoning **Status:** Approved **Reviewer:** Jeanine Bourke **Approval Date:** 10/24/2005
Note: **Ok to Issue:**

Dept: Building **Status:** Approved **Reviewer:** Jeanine Bourke **Approval Date:** 11/07/2005
Note: 10/24/05 spoke w/Avery to see if replacing in kind, or new, rooftop unit is new, the 6 hanging units replace existing similar units. Left vm w/Cptn. Mark U. @ sal army for more details. 10128 He called back left vm with questions 11/01 Left vm w/Cptn. Mark U. About structural details of roof for the new rooftop hvac units. 11/7 Received structurals on 11/4, ok to issue
 1) The installation must comply with the State of Maine Gas Regulations.

Dept: Fire **Status:** Approved **Reviewer:** Cptn Greg Cass **Approval Date:** 10/24/2005
Note: **Ok to Issue:**
 1) Must be installed per NFPA 54

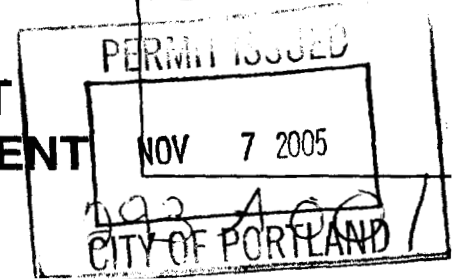
Comments:
 10/24/2005-GG: Need ASAP permit, no heat. /gg



FILL IN AND SIGN WITH INK

APPLICATION FOR PERMIT HEATING OR POWER EQUIPMENT

051555



To the INSPECTOR OF BUILDINGS, PORTLAND, ME.

The undersigned hereby applies for a permit to install the following heating, cooking or power equipment in accordance with the Laws of Maine, the Building Code of the City of Portland, and the following specifications:

Location / CBL _____ Use of Building _____ Date 10/24/05
 Name and address of owner of appliance SALVATION ARMY
30 WARREN AVE. PORTLAND, ME
 Installer's name and address ALERY SERVICES, INC 7 THOMAS DRIVE
WESTBROOK, ME 04092 Telephone 772-8687
 Fax 874-0933

Location of appliance:

- Basement
- Attic
- Floor
- Roof
- Hanging units

Type of Fuel:

- Gas
- Oil
- Solid

Appliance Name: CARRIER (RTU), Stealing Unit Heaters
 U.L. Approved Yes No

Will appliance be installed in accordance with the manufacture's installation instructions? Yes No

IF NO Explain: _____

The Type of License of Installer:

- Master Plumber # _____
- Solid Fuel # _____
- Oil # _____
- Gas # PNT 1431
- Other _____

Type of Chimney:

- Masonry Lined
- Factory built NA

- Metal
- Factory Built U.L. Listing # _____

- Direct Vent (Steeple)
- Type Side Wall

Type of Fuel Tank

- Oil
- Gas

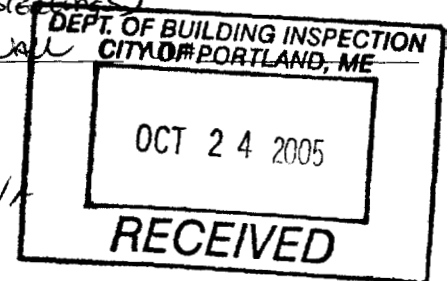
Size of Tank NA

Number of Tanks NA

Distance from Tank to Center of Flame NA feet.

Cost of Work: \$ 39,989.00 NO

Permit Fee: \$ 381.00 Horizontal



Approved

Fire: _____
 Ele.: _____
 Bldg.: _____

Approved with Conditions

- See attached letter or requirement

Signature of Installer Michael Searcy

Inspector's Signature _____

Date Approved _____

PROPOSAL

1000

AVERY SERVICES, INC.
7 Thomas Drive
WESTBROOK, MAINE 04092
(207) 772-8687

FAX (207) 874-0933

TO: **The Salvation Army**
88 Preble Street
Portland Me 04101

PHONE	DATE
Installation of HVAC Equipment	
JOB NUMBER M D/ # 58 0039	JOB PHONE

We hereby submit specifications and estimates for:

Avery Services, Inc. is pleased to submit a quote to perform the following work:

Provide & install (6) six Sterling gas fired unit heaters for the clothes sorting area and the warehouse area (where the (2) two big garage doors are located).

Provide & install sidewall flue venting for each of the (6) six Sterling unit heaters.

Tie into the existing gas piping network.

Provide & install (for the Office area) a Carrier 48TFE008 gas/electric packaged roof top unit with Economizer and roof curb (roof work done by others).

Provide & install a galvanized ductwork system comprised of (12) twelve ceiling supplies and (1) one main return grill. All ductwork above will be wrapped with 1 1/2" insulation with a vapor barrier.

Provide & install a (non programmable) Thermostat for each of the (6) six Sterling unit heaters and (1) One (programmable) Thermostat for the Office Rooftop Unit.

Start up and test.

EXCLUSIONS: Structural (Engineer cost), Power Wiring, Roofing Work, Adequacy of Existing Systems.

Avery
Mike Darling 415-7602 all

Sal. Army
Cpt. Mark Unruh
878-8555

We Propose hereby to furnish material and labor — complete in accordance with the above specifications, for the sum of:

Thirty Nine Thousand Nine Hundred Eighty Nine and 00/100 Dollars dollars (\$) 39

Payment to be made as follows:

25% upon acceptance - Progress billing/net (10) ten days - All balances due upon substantial completion.

If payment is not made as outlined above, a service charge of 2% per month on the overdue balance plus all reasonable costs of collection, including attorney's fees will be paid.

All material is guaranteed to be as specified. All work to be completed in a professional manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado, and other necessary insurance. Our workers are fully covered by Worker's Compensation insurance.

Authorized Signature

Note: This proposal may be withdrawn by us if not accepted within thirty days.

Acceptance of Proposal — The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Signature

Signature

Date of Acceptance: _____

Table 1 - Performance and Dimensional Data - Tubular Propeller Unit Heater

Unit Size	100	125	150	175	200	250	300	350	400
PERFORMANCE DATA†									
Input - BTU/Hr.	100,000	125,000	150,000	175,000	200,000	250,000	300,000	350,000	400,000
(kW)	(29.3)	(36.6)	(43.9)	(51.2)	(58.6)	(73.2)	(87.8)	(102.5)	(117.1)
Output - BTU/Hr.	81,000	101,250	121,500	141,750	162,000	202,500	243,000	283,500	324,000
(kW)	(23.7)	(29.6)	(35.6)	(41.5)	(47.5)	(59.3)	(71.2)	(83.0)	(95.0)
Thermal Efficiency (%)	81	81	81	81	81	81	81	81	81
Free Air Delivery - CFM	1,600	2,200	2,400	2,850	3,200	3,450	5,000	5,600	5,800
(cu. m/s)	(0.756)	(1.039)	(1.133)	(1.346)	(1.511)	(1.629)	(2.361)	(2.644)	(2.738)
Air Temperature Rise - Deg. F	47	42	47	46	47	54	45	47	51
(Deg. C)	(26)	(23)	(26)	(26)	(26)	(30)	(24)	(26)	(28)
Full Load Amps at 120V	6.6	8	7.8	8.3	8.3	8.3	12.5	12.5	12.5
MOTOR DATA: Motor HP (Qty.)									
	1/10	1/4	1/4	1/3	1/3	1/3	(2) 1/4	(2) 1/3	(2) 1/3
Motor kW	(0.75)	(0.19)	(0.19)	(0.25)	(0.25)	(0.25)	(0.19)	(0.25)	(0.25)
Motor Type	SP	PSC	PSC	PSC	PSC	PSC	PSC	PSC	PSC
R.P.M.	1,050	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140
Amps @ 115V	2.8	4.0	4.0	4.5	4.5	4.5	8.0	9.0	9.0
DIMENSIONAL DATA - inches (mm)									
"A" Overall Height to Top of Flue	33-3/4 (857)	33-3/4 (857)	33-3/4 (857)	33-3/4 (857)	33-3/4 (857)	33-3/4 (857)	34 (864)	34 (864)	34 (864)
"B" Jacket Width of Unit	20-3/4 (527)	20-3/4 (527)	20-3/4 (527)	32-3/4 (831)	32-3/4 (831)	32-3/4 (831)	50-3/4 (1289)	50-3/4 (1289)	50-3/4 (1289)
"C" Width to CL Flue	13-3/8 (340)	13-3/8 (340)	13-3/8 (340)	19-3/8 (492)	19-3/8 (492)	19-3/8 (492)	28-3/8 (721)	28-3/8 (721)	28-3/8 (721)
"D" Depth to Rear of Housing	11 (279)	11 (279)	11 (279)	11 (279)	11 (279)	11 (279)	12-1/4 (311)	12-1/4 (311)	12-1/4 (311)
"E" Hanging Distance Width	18-5/8 (473)	18-5/8 (473)	18-5/8 (473)	30-5/8 (778)	30-5/8 (778)	30-5/8 (778)	48-5/8 (1235)	48-5/8 (1235)	48-5/8 (1235)
"F" Discharge Opening Width	18-3/4 (476)	18-3/4 (476)	18-3/4 (476)	30-3/4 (781)	30-3/4 (781)	30-3/4 (781)	48-3/4 (1238)	48-3/4 (1238)	48-3/4 (1238)
"G" Depth to CL Flue	4-3/4 (121)	4-3/4 (121)	4-3/4 (121)	4-3/4 (121)	4-3/4 (121)	4-3/4 (121)	5-1/8 (130)	5-1/8 (130)	5-1/8 (130)
"H" Discharge Opening Height	24-1/2 (622)	24-1/2 (622)	24-1/2 (622)	24-1/2 (622)	24-1/2 (622)	24-1/2 (622)	24-1/2 (622)	24-1/2 (622)	24-1/2 (622)
"L" Overall Unit Width	25-1/4 (641)	25-1/4 (641)	25-1/4 (641)	37-1/4 (946)	37-1/4 (946)	37-1/4 (946)	55-1/4 (1403)	55-1/4 (1403)	55-1/4 (1403)
"Flue Size Diameter - in. (Dia.-mm)	5 (127)	5 (127)	5 (127)	5 (127)	5 (127)	5 (127)	6 (152)	6 (152)	6 (152)
Fan Diameter - in. (Qty.)	16 (2)	16 (2)	16 (2)	18 (2)	18 (2)	18 (2)	18 (2)	18 (2)	18 (2)
Gas Inlet-Natural Gas (in.)	1/2	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4
Gas Inlet-LP Gas (in.)	1/2	1/2	1/2	1/2	1/2	1/2 OR 3/4	1/2 OR 3/4	1/2 OR 3/4	1/2 OR 3/4
Approximate Unit Weight - lbs. (kg)	133 (60)	145 (66)	155 (70)	191 (87)	201 (91)	211 (96)	307 (139)	321 (145)	335 (152)
Approximate Ship Weight - lbs. (kg)	173 (78)	185 (84)	195 (88)	241 (109)	251 (114)	261 (118)	367 (166)	381 (173)	395 (179)

* Canadian unit includes the vent cap. * For all installations, the flue collar is included with the unit and should be field installed per the instructions included with the unit.
 † Ratings shown are for unit installations at elevations between 0 and 2,000 ft. (0 to 610m). For unit installations in U.S.A. above 2,000 ft. (610m), the unit input must be derated 4% for each 1,000 ft. (305m) above sea level, refer to local codes, or in absence of local codes, refer to the National Fuel Gas Code, ANSI Standard Z223.1-1998 (N.F.P.A. No. 54), or the latest edition of.
 For installations in Canada, any reference to deration at altitudes in excess of 2,000 ft. (610m) are to be ignored. At altitudes of 2,000 ft. to 4,500 ft. (610 to 1372m), the unit must be derated to 90% of the normal altitude rating, and be so marked in accordance with the C.G.A. certification.

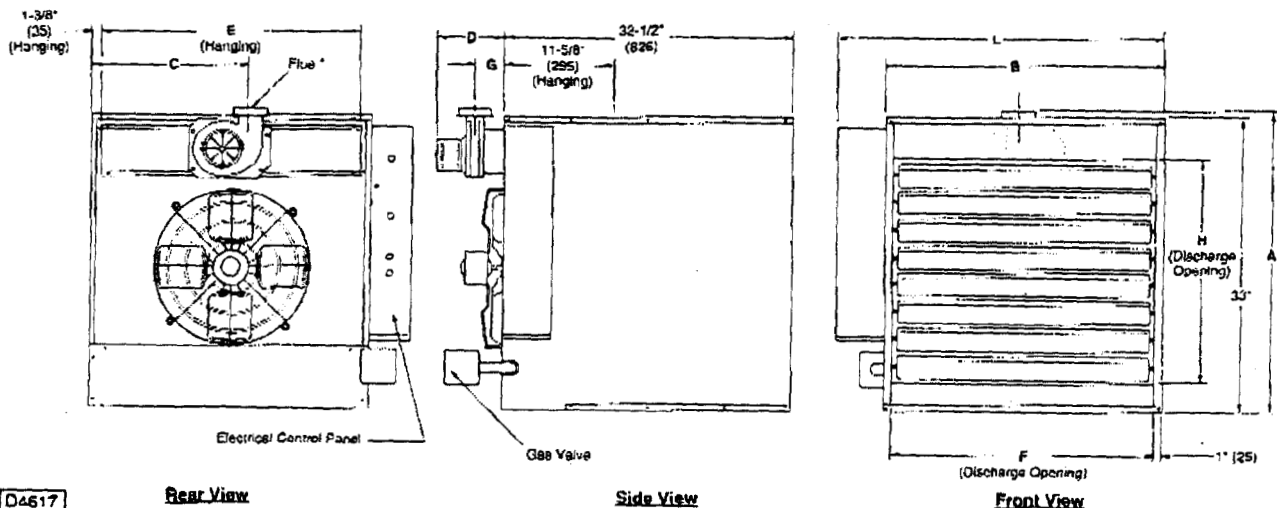


Figure 2 - Dimensional Drawing - Tubular Propeller Unit Heater

D4617

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED IN PARENTHESES (MM)

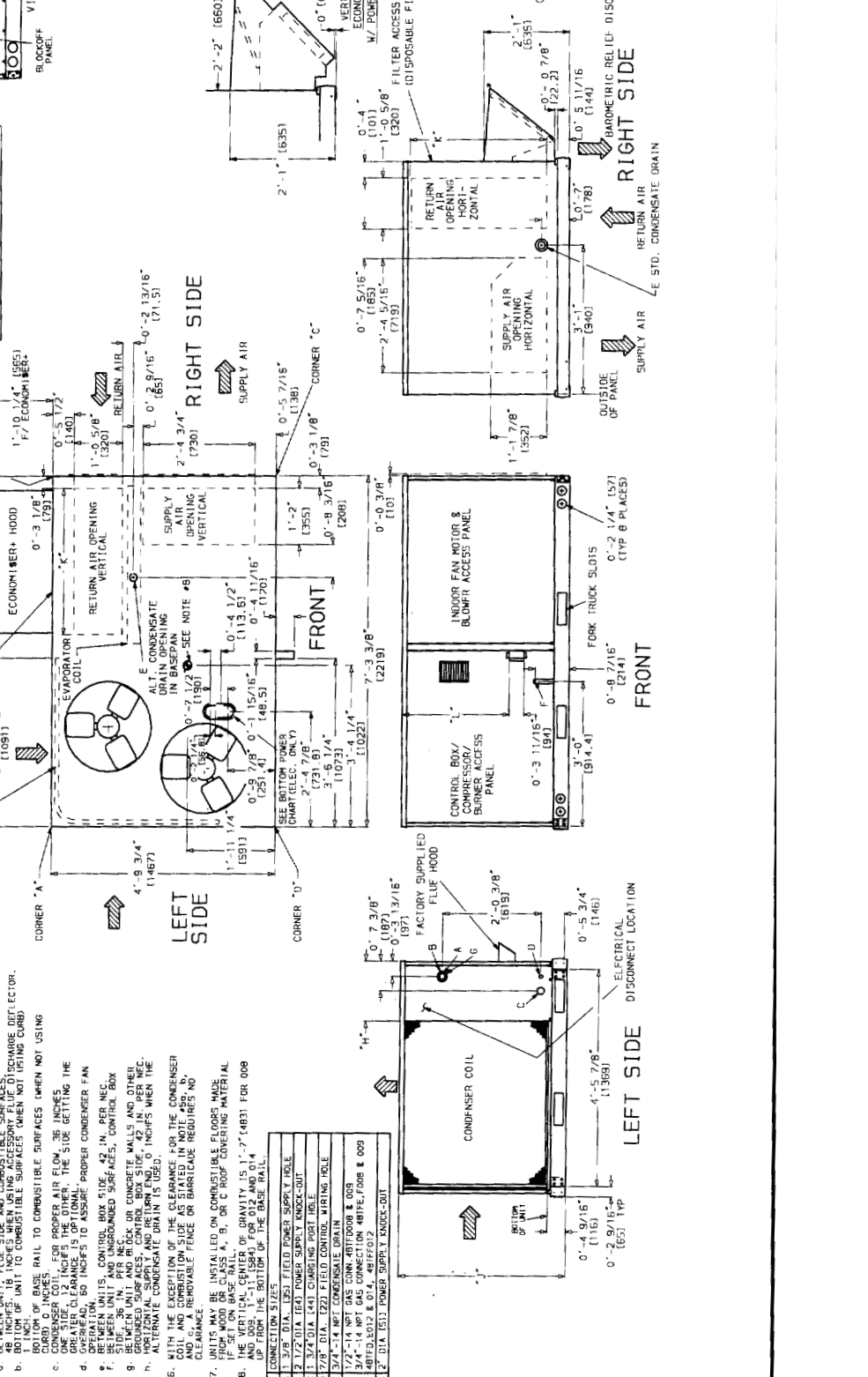
Base unit dimensions — 48TF008-014



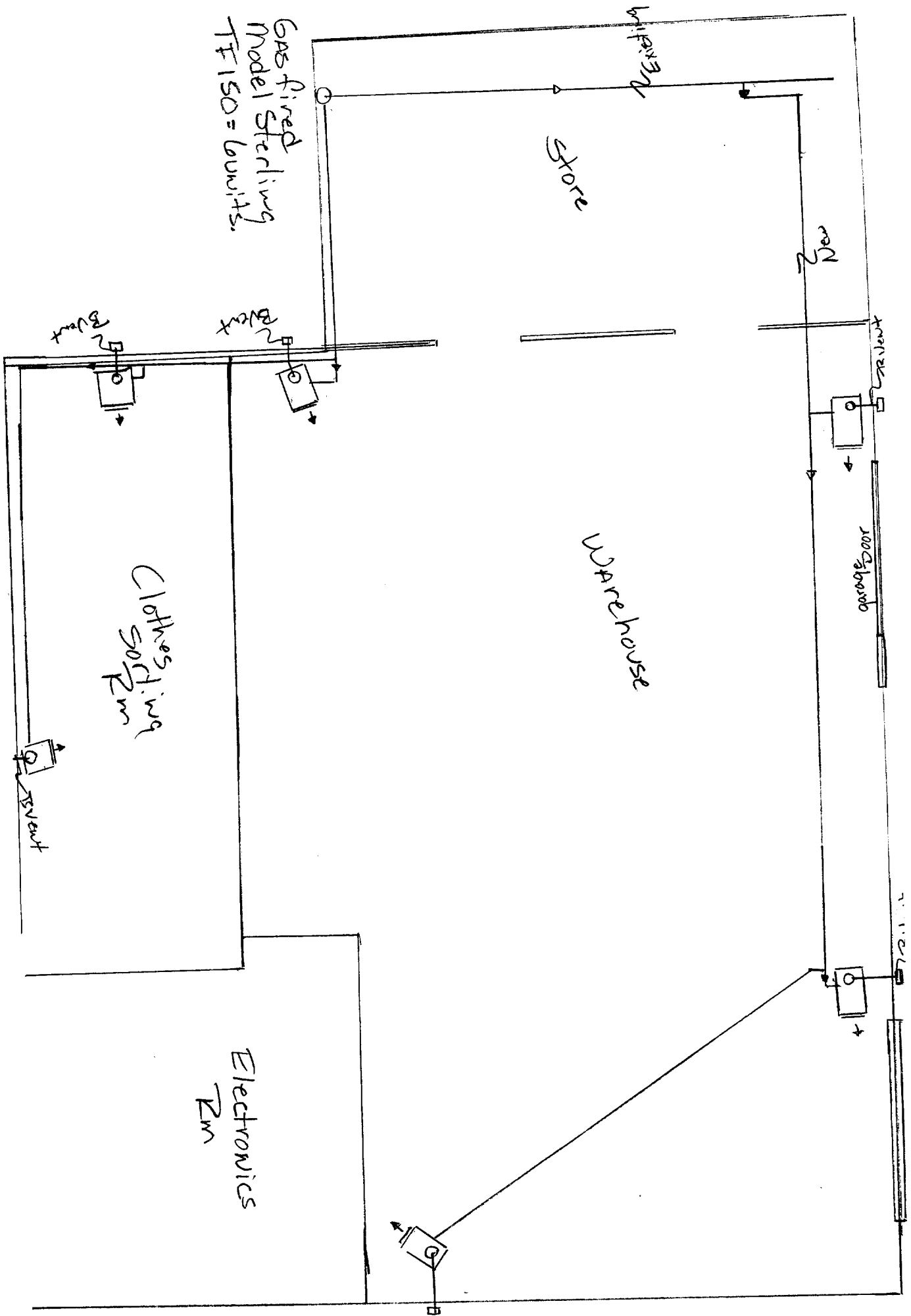
UNIT	STD. UNIT WEIGHT		ECONOMIZER+VERT. WEIGHT		W/ P.E. WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)	
	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG
481FE/TFE/TFD008	870	395	75	34.1	145	65.9	189	86	161	73	33	238	109	280
481FE/TFE/TFD009	880	399	87	39.4	151	68.5	191	87	163	74	34	242	110	284
481FE/TFE/TFD012	1035	469	102	46.3	225	102	225	102	192	87	39	333	151	333
481FE/TFE/TFD014	1050	476	103	46.7	228	103	228	103	195	88	39	336	153	336

BOTTOM POWER CHART
 THESE HOLES WERE FOR USE WITH ACCESSORY PACKAGES - 4403 (ECONOMIZER), 4404 (ECONOMIZER+VERT.), 4405 (ECONOMIZER+VERT. W/ POWER EXHAUST).
 CONDUIT SIZE WIRE SIZES (MAX.)

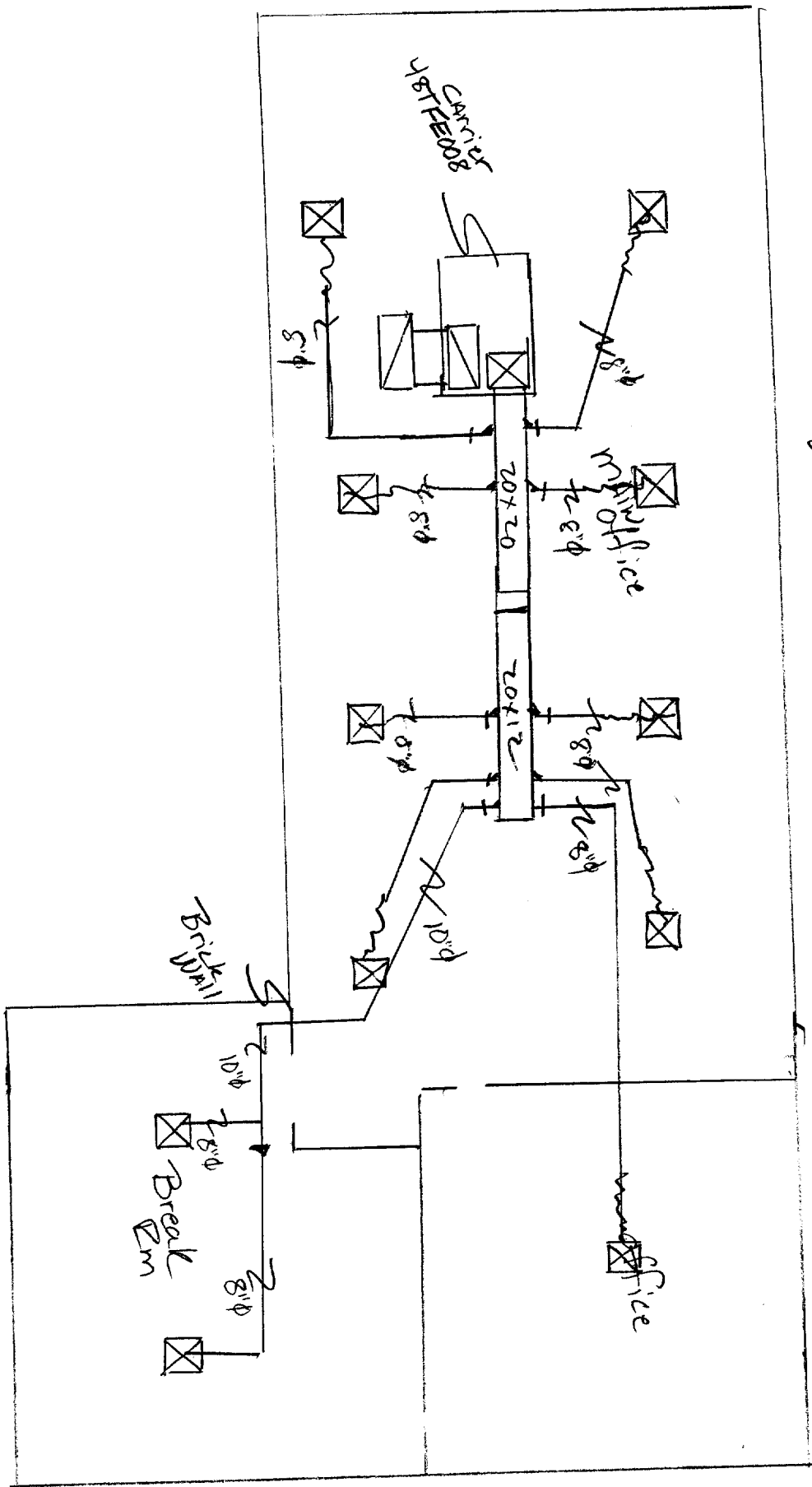
1/2"	ACC. 7/8" (22.2)
3/4"	ACC. 1 1/8" (28.6)
1"	ACC. 1 3/8" (34.9)
1 1/4"	ACC. 1 7/8" (44.4)
1 1/2"	ACC. 2" (50.8)
2"	ACC. 2 1/2" (63.5)
2 1/2"	ACC. 3" (76.2)
3"	ACC. 3 1/2" (88.9)
3 1/2"	ACC. 4" (101.6)
4"	ACC. 4 1/2" (114.3)
4 1/2"	ACC. 5" (127.0)
5"	ACC. 5 1/2" (139.7)
5 1/2"	ACC. 6" (152.4)
6"	ACC. 6 1/2" (165.1)
6 1/2"	ACC. 7" (177.8)
7"	ACC. 7 1/2" (190.5)
7 1/2"	ACC. 8" (203.2)
8"	ACC. 8 1/2" (215.9)
8 1/2"	ACC. 9" (228.6)
9"	ACC. 9 1/2" (241.3)
9 1/2"	ACC. 10" (254.0)
10"	ACC. 10 1/2" (266.7)
10 1/2"	ACC. 11" (279.4)
11"	ACC. 11 1/2" (292.1)
11 1/2"	ACC. 12" (304.8)
12"	ACC. 12 1/2" (317.5)
12 1/2"	ACC. 13" (330.2)
13"	ACC. 13 1/2" (342.9)
13 1/2"	ACC. 14" (355.6)
14"	ACC. 14 1/2" (368.3)
14 1/2"	ACC. 15" (381.0)
15"	ACC. 15 1/2" (393.7)
15 1/2"	ACC. 16" (406.4)
16"	ACC. 16 1/2" (419.1)
16 1/2"	ACC. 17" (431.8)
17"	ACC. 17 1/2" (444.5)
17 1/2"	ACC. 18" (457.2)
18"	ACC. 18 1/2" (469.9)
18 1/2"	ACC. 19" (482.6)
19"	ACC. 19 1/2" (495.3)
19 1/2"	ACC. 20" (508.0)
20"	ACC. 20 1/2" (520.7)
20 1/2"	ACC. 21" (533.4)
21"	ACC. 21 1/2" (546.1)
21 1/2"	ACC. 22" (558.8)
22"	ACC. 22 1/2" (571.5)
22 1/2"	ACC. 23" (584.2)
23"	ACC. 23 1/2" (596.9)
23 1/2"	ACC. 24" (609.6)
24"	ACC. 24 1/2" (622.3)
24 1/2"	ACC. 25" (635.0)
25"	ACC. 25 1/2" (647.7)
25 1/2"	ACC. 26" (660.4)
26"	ACC. 26 1/2" (673.1)
26 1/2"	ACC. 27" (685.8)
27"	ACC. 27 1/2" (698.5)
27 1/2"	ACC. 28" (711.2)
28"	ACC. 28 1/2" (723.9)
28 1/2"	ACC. 29" (736.6)
29"	ACC. 29 1/2" (749.3)
29 1/2"	ACC. 30" (762.0)
30"	ACC. 30 1/2" (774.7)
30 1/2"	ACC. 31" (787.4)
31"	ACC. 31 1/2" (800.1)
31 1/2"	ACC. 32" (812.8)
32"	ACC. 32 1/2" (825.5)
32 1/2"	ACC. 33" (838.2)
33"	ACC. 33 1/2" (850.9)
33 1/2"	ACC. 34" (863.6)
34"	ACC. 34 1/2" (876.3)
34 1/2"	ACC. 35" (889.0)
35"	ACC. 35 1/2" (901.7)
35 1/2"	ACC. 36" (914.4)
36"	ACC. 36 1/2" (927.1)
36 1/2"	ACC. 37" (939.8)
37"	ACC. 37 1/2" (952.5)
37 1/2"	ACC. 38" (965.2)
38"	ACC. 38 1/2" (977.9)
38 1/2"	ACC. 39" (990.6)
39"	ACC. 39 1/2" (1003.3)
39 1/2"	ACC. 40" (1016.0)
40"	ACC. 40 1/2" (1028.7)
40 1/2"	ACC. 41" (1041.4)
41"	ACC. 41 1/2" (1054.1)
41 1/2"	ACC. 42" (1066.8)
42"	ACC. 42 1/2" (1079.5)
42 1/2"	ACC. 43" (1092.2)
43"	ACC. 43 1/2" (1104.9)
43 1/2"	ACC. 44" (1117.6)
44"	ACC. 44 1/2" (1130.3)
44 1/2"	ACC. 45" (1143.0)
45"	ACC. 45 1/2" (1155.7)
45 1/2"	ACC. 46" (1168.4)
46"	ACC. 46 1/2" (1181.1)
46 1/2"	ACC. 47" (1193.8)
47"	ACC. 47 1/2" (1206.5)
47 1/2"	ACC. 48" (1219.2)
48"	ACC. 48 1/2" (1231.9)
48 1/2"	ACC. 49" (1244.6)
49"	ACC. 49 1/2" (1257.3)
49 1/2"	ACC. 50" (1270.0)
50"	ACC. 50 1/2" (1282.7)
50 1/2"	ACC. 51" (1295.4)
51"	ACC. 51 1/2" (1308.1)
51 1/2"	ACC. 52" (1320.8)
52"	ACC. 52 1/2" (1333.5)
52 1/2"	ACC. 53" (1346.2)
53"	ACC. 53 1/2" (1358.9)
53 1/2"	ACC. 54" (1371.6)
54"	ACC. 54 1/2" (1384.3)
54 1/2"	ACC. 55" (1397.0)
55"	ACC. 55 1/2" (1409.7)
55 1/2"	ACC. 56" (1422.4)
56"	ACC. 56 1/2" (1435.1)
56 1/2"	ACC. 57" (1447.8)
57"	ACC. 57 1/2" (1460.5)
57 1/2"	ACC. 58" (1473.2)
58"	ACC. 58 1/2" (1485.9)
58 1/2"	ACC. 59" (1498.6)
59"	ACC. 59 1/2" (1511.3)
59 1/2"	ACC. 60" (1524.0)
60"	ACC. 60 1/2" (1536.7)
60 1/2"	ACC. 61" (1549.4)
61"	ACC. 61 1/2" (1562.1)
61 1/2"	ACC. 62" (1574.8)
62"	ACC. 62 1/2" (1587.5)
62 1/2"	ACC. 63" (1600.2)
63"	ACC. 63 1/2" (1612.9)
63 1/2"	ACC. 64" (1625.6)
64"	ACC. 64 1/2" (1638.3)
64 1/2"	ACC. 65" (1651.0)
65"	ACC. 65 1/2" (1663.7)
65 1/2"	ACC. 66" (1676.4)
66"	ACC. 66 1/2" (1689.1)
66 1/2"	ACC. 67" (1701.8)
67"	ACC. 67 1/2" (1714.5)
67 1/2"	ACC. 68" (1727.2)
68"	ACC. 68 1/2" (1739.9)
68 1/2"	ACC. 69" (1752.6)
69"	ACC. 69 1/2" (1765.3)
69 1/2"	ACC. 70" (1778.0)
70"	ACC. 70 1/2" (1790.7)
70 1/2"	ACC. 71" (1803.4)
71"	ACC. 71 1/2" (1816.1)
71 1/2"	ACC. 72" (1828.8)
72"	ACC. 72 1/2" (1841.5)
72 1/2"	ACC. 73" (1854.2)
73"	ACC. 73 1/2" (1866.9)
73 1/2"	ACC. 74" (1879.6)
74"	ACC. 74 1/2" (1892.3)
74 1/2"	ACC. 75" (1905.0)
75"	ACC. 75 1/2" (1917.7)
75 1/2"	ACC. 76" (1930.4)
76"	ACC. 76 1/2" (1943.1)
76 1/2"	ACC. 77" (1955.8)
77"	ACC. 77 1/2" (1968.5)
77 1/2"	ACC. 78" (1981.2)
78"	ACC. 78 1/2" (1993.9)
78 1/2"	ACC. 79" (2006.6)
79"	ACC. 79 1/2" (2019.3)
79 1/2"	ACC. 80" (2032.0)
80"	ACC. 80 1/2" (2044.7)
80 1/2"	ACC. 81" (2057.4)
81"	ACC. 81 1/2" (2070.1)
81 1/2"	ACC. 82" (2082.8)
82"	ACC. 82 1/2" (2095.5)
82 1/2"	ACC. 83" (2108.2)
83"	ACC. 83 1/2" (2120.9)
83 1/2"	ACC. 84" (2133.6)
84"	ACC. 84 1/2" (2146.3)
84 1/2"	ACC. 85" (2159.0)
85"	ACC. 85 1/2" (2171.7)
85 1/2"	ACC. 86" (2184.4)
86"	ACC. 86 1/2" (2197.1)
86 1/2"	ACC. 87" (2209.8)
87"	ACC. 87 1/2" (2222.5)
87 1/2"	ACC. 88" (2235.2)
88"	ACC. 88 1/2" (2247.9)
88 1/2"	ACC. 89" (2260.6)
89"	ACC. 89 1/2" (2273.3)
89 1/2"	ACC. 90" (2286.0)
90"	ACC. 90 1/2" (2298.7)
90 1/2"	ACC. 91" (2311.4)
91"	ACC. 91 1/2" (2324.1)
91 1/2"	ACC. 92" (2336.8)
92"	ACC. 92 1/2" (2349.5)
92 1/2"	ACC. 93" (2362.2)
93"	ACC. 93 1/2" (2374.9)
93 1/2"	ACC. 94" (2387.6)
94"	ACC. 94 1/2" (2400.3)
94 1/2"	ACC. 95" (2413.0)
95"	ACC. 95 1/2" (2425.7)
95 1/2"	ACC. 96" (2438.4)
96"	ACC. 96 1/2" (2451.1)
96 1/2"	ACC. 97" (2463.8)
97"	ACC. 97 1/2" (2476.5)
97 1/2"	ACC. 98" (2489.2)
98"	ACC. 98 1/2" (2501.9)
98 1/2"	ACC. 99" (2514.6)
99"	ACC. 99 1/2" (2527.3)
99 1/2"	ACC. 100" (2540.0)



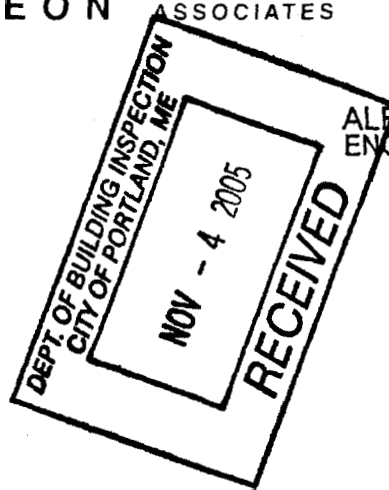
COMMERCIAL HVAC



WARREN AVE



ALEXANDER HUTCHEON ASSOCIATES
ENGINEERS



ALEXANDER HUTCHEON ASSOCIATES
ENGINEERS
49 FALMOUTH ROAD
FALMOUTH, MAINE 04103
TELEPHONE (207) 781-3364
FAX (207) 781-3364
CELL PHONE (207) 233-7662

November 4, 2005

Captain Mark Unruh
The Salvation Army
30 Warren Avenue
Portland, Maine 04103

Re: Analysis of roof structure for new gas heaters

Dear Captain Unruh:

At your request, I have examined the complex of buildings at 30 Warren Avenue, Portland, Maine, and I have analyzed the various structural components which will be subjected to loads from new gas-fired heaters, to be installed by Avery Services.

As shown on the enclosed framing plans and calculation sheets, the existing structure will be adequate, in all instances, for the installation of the proposed heaters, in the locations indicated.

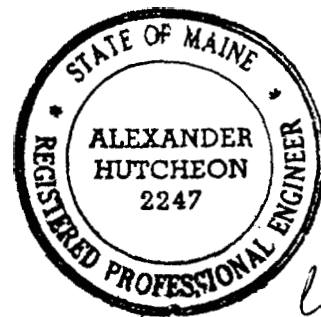
Your questions and comments regarding this report are welcome.

Very truly yours,

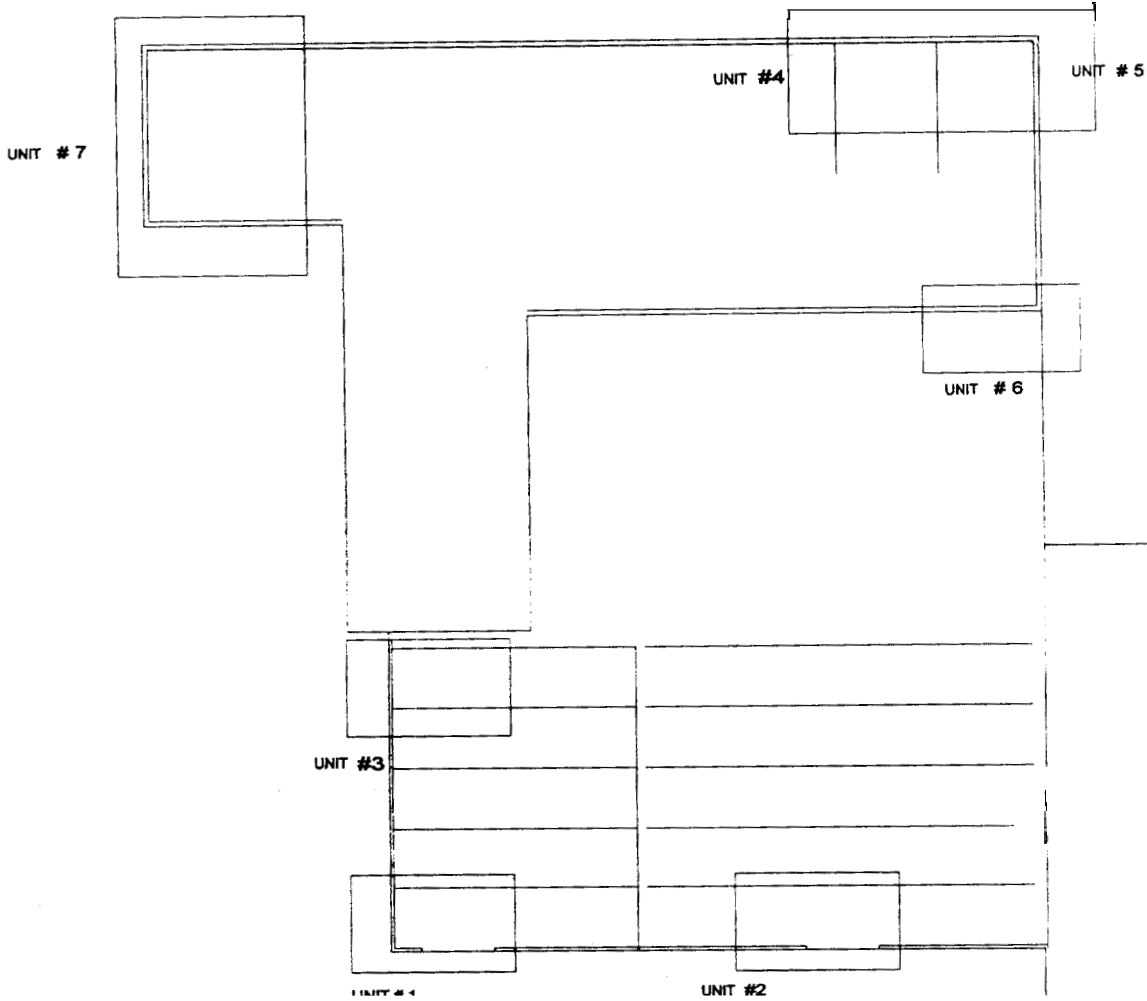
ALEXANDER HUTCHEON Associates,
Engineers

Alexander Hutcheon, P.E.
President

Enclosures: Calculation sheets 1 - 10



29051555
293-A1

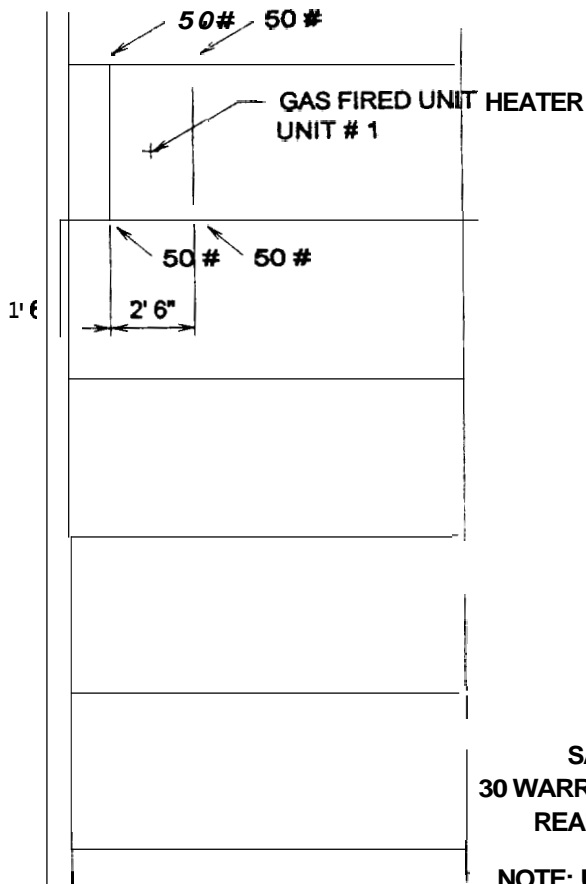
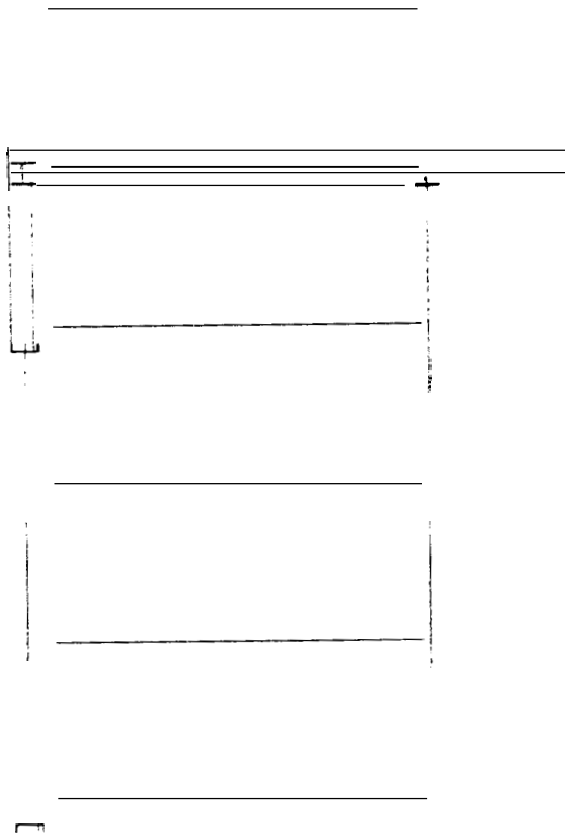


11/24/15

SALVATION ARMY BUILDING
 30 WARREN AVENUE, PORTLAND, ME.

ALEXANDER HUTCHEON Associates,
 Engineers
 918 Congress Street Portland, ME 04104
 NOV. 3, 2008 (207) 774-8484
 Fax: (207) 774-8484

SAT. # 1 OF 10



SALVATION ARMY
 30 WARREN AVE., PORTLAND, ME.
 REAR: METAL BUILDING

NOTE: UNIT #1 IS SHOWN; SUPPORT
 FOR UNITS # 2 AND # 3 ARE IDENTICAL

SHT. # 2 OF 10

VALVATION HIGHWAY, 20 WARREN AVE.

ENGINEERS

49 FALMOUTH ROAD
FALMOUTH, MAINE 04105
TELEPHONE (207) 781-3364
FAX (207) 781-3364
CELL PHONE (207) 233-7652

SHT. 3 OF 10

11/3/05

METAL BUILDING: 10" PURLINS

SPAN = 12'-0"

SPACING = 57"

L.L. = 42 PSF.

DL = $\frac{3 \text{ ROOFING} + 2 \text{ INSUL} + 2 \text{ COLL.}}{7}$

TOTAL LOAD = 49 PSF.

LOAD TO PURLIN = $49(4.75) + 5 = 237.8$ PLF.

MOMENT = $0.125(237.8)(12)^2 = 4280.4$ LB

FOR 10" ZEE PURLIN; $I = 21.88$ IN⁴

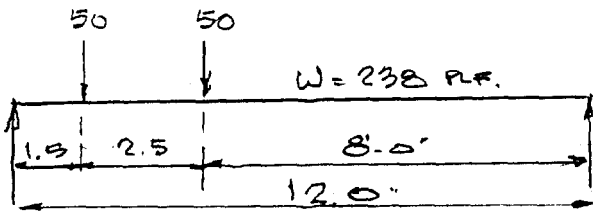
$S = 21.88 / 5 = 4.38$ IN³

SEE NEXT 2 SHEETS
"SECTION PROGRAM"

$f_b = 4280.4(12) / 4.38 = 11,737.8$ PSI

$F_b = 0.6(50,000) = 30,000$ PSI.

GAS-FIRED UNIT HEATER



$R_L = 1505$

$R_R = 1451$

$V = 0$ AT $12 - 1451/238 = 5.9'$ FROM R_L OR $6.10'$ FROM R_R

$M_{max} = 1451(6) - 238(6.10)^2(5) = 4418.2$ LB

$f_b = 4418.2(12) / 4.38 = 12,105$ PSI < 30,000 OK

LOADS

P1 = -50.00

dP1 = 1.50

P2 = -50.00

dP2 = 2.50

w1 = -238.00

L1 = 12.00

dW1 = 0.00

SPAN = 12.00

REACTIONS

LEFT = 1,505.88

RIGHT = 1,450.92

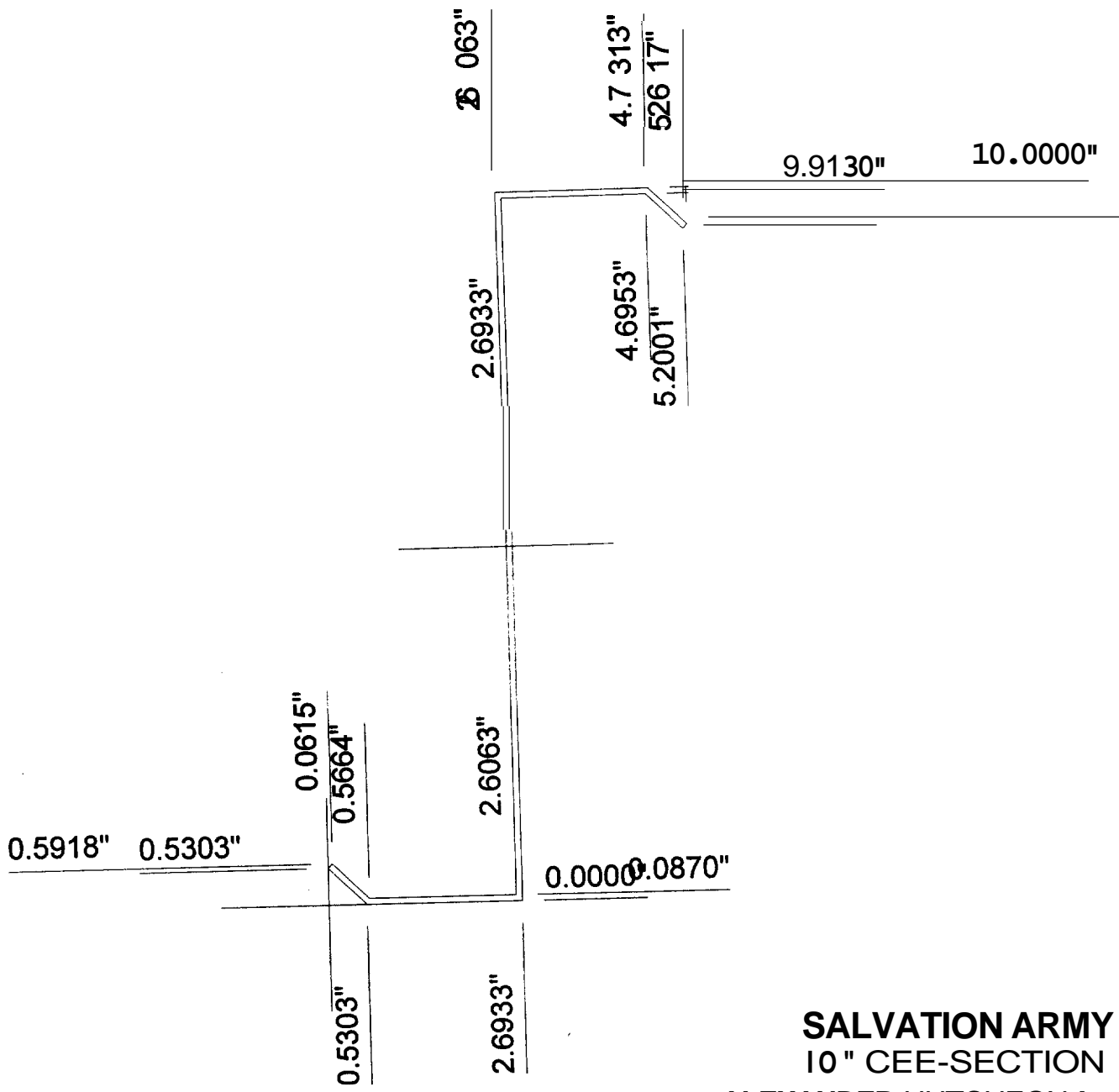
HP-41 "SECTION" PROGRAM

SHT. 4 OF 10

11/3/05

	XROM "SECTION"		ORIGINRL RXIS	
X0=?	0	RUN	IX=-66.18E0	
YB=?	.5303	RUN	IY=-14.36E0	
X1=?	.5303	RUN	IXY=-28.21E0	XEQ C
Y1=?	0	RUN	CENTROID AXIS	
X2=?	2,6933	RUN	IX=-21.80E0	
Y2=?	0	RUN	IY=-1.995E0	
X3=?	2,6933	RUN	IXY=-4.788E0	XEQ A
Y3=?	9,9130	RUN	CENTROID	
X4=?	4,6875	RUN	X=2.876E0	
Y4=?	9,9130	RUN	Y=5.449E0	
X5=?	5,2001	RUN	AREA=-1.495E0	
Y5=?	9,4082	RUN		
X6=?	5,2617	RUN		
Y6=?	9,4697	RUN		
X7=?	5,2617	RUN		
Y7=?	10	RUN		
X8=?	2,6063	RUN		
Y8=?	10	RUN		
X9=?	2,6063	RUN		
Y9=?	.087	RUN		
X10=?	.5664	RUN		
Y10=?	.087	RUN		
X11=?	.0615	RUN		
Y11=?	.5918	RUN		
X12=?	0	RUN		
Y12=?	.5303	RUN		
X13=?				XEQ B

SEE NEXT SHEET FOR COORDINATES



SALVATION ARMY
10" CEE-SECTION

ALEXANDER HUTCHEON Associates,
Engineers

519 Congress Street

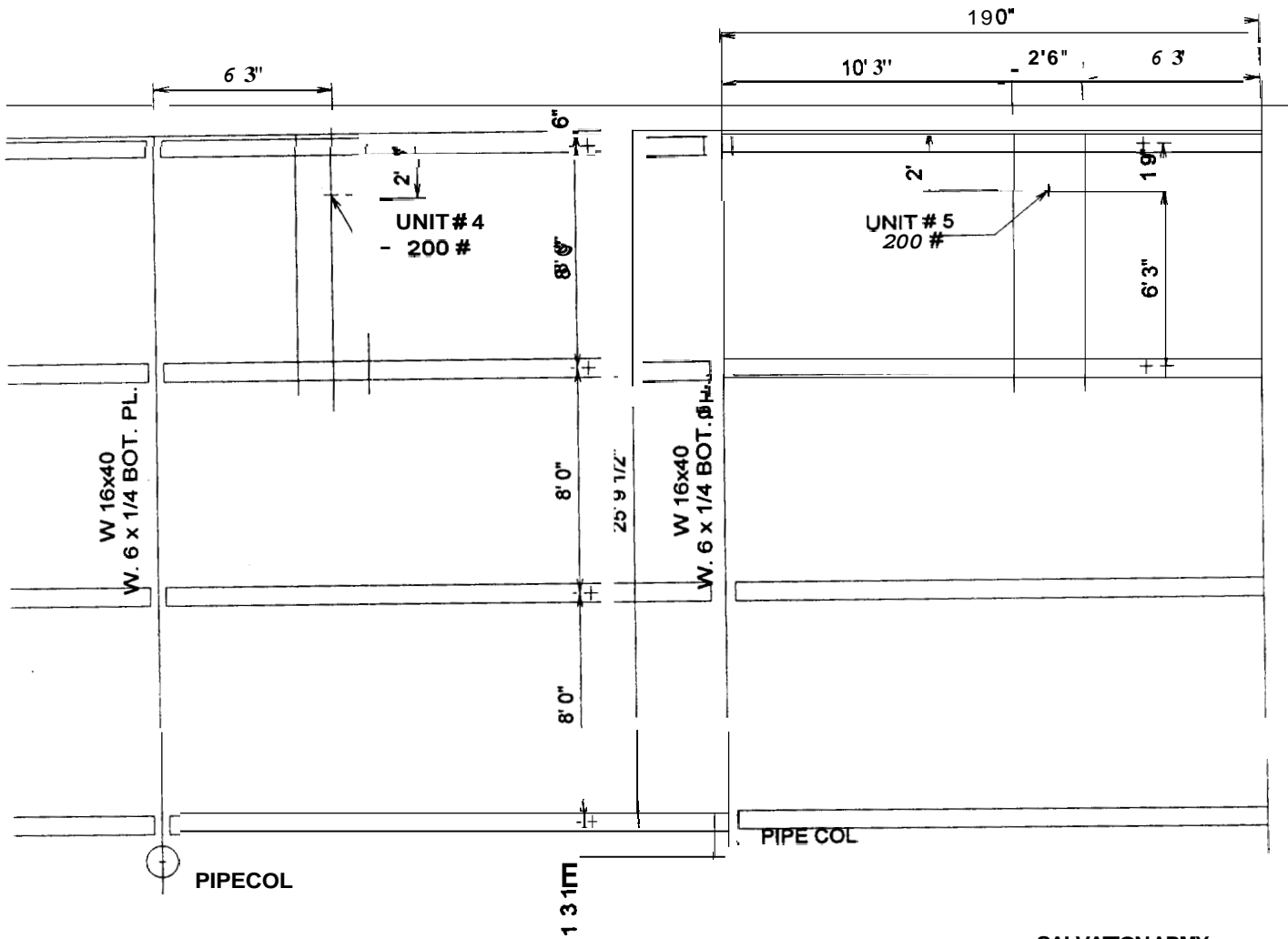
Portland, ME 04101

(207) 774-0484

NOV. 3, 2005

Fax: (207) 774-0484

SHT. # 5 OF 10



NOTE: UNIT # 6 IDENTICAL SUPPORT TO UNIT # 5

SALVATIONARMY
 30 WARREN AVE., PORTLAND, ME.
 RIGHT-FRONT CORNER

SHT. # 6 OF 10
 11/30/05

SALVATION ARMY, 20 WARREN AVE

ENGINEERS

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FALMOUTH, MAINE 04105
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CELL PHONE (207) 233-7662

EIGHT FRONT CORNER

SH. # 7 of 10

11/3/05

EXISTING ROOF BEAMS 2x12 @ 8' o.c.

LIVELOAD = 42 PSF.

DEAD LOAD 3 ROOFING
3 PLANK
2 COLLATERAL

TOTAL LOAD = 50 PSF

LOAD TO BEAM = $50(8) + 20 = 420$ PLF.

SPAN = 19'

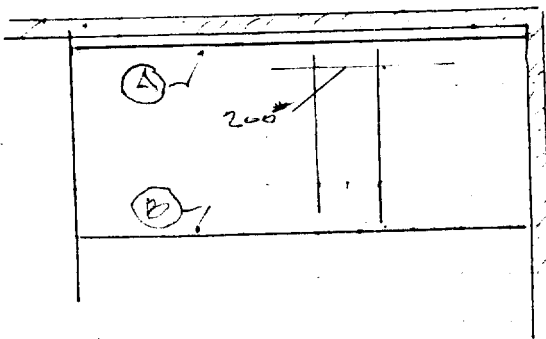
$R = 19(.5)(420) = 3990 \#$

$M = .125(420)(19)^2 = 18,952$

SECT. MOD. = 165.313 IN³

$f_b = 18952(12)/165.313 = 1376$ PSI

$f_b = 1.15(1400) = 1610$ PSI OK



HEADER LOAD TO Bm A

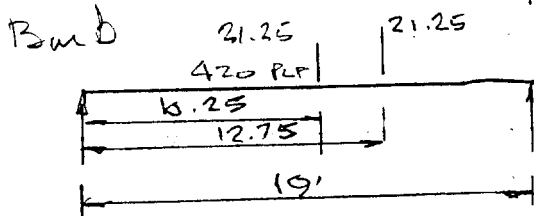
$200(.3/8) = 157.5$

OR 78.8 #/FOOT

HEADER TO Bm Y

$200 - 157.5 = 42.5$

OR 21.25 #/FOOT



$R_L = 4006.8$

$R_R = 4015.7$

$V = 0$ @ 9.54' FROM R_L

$M_{MAX} = 19,112.1 \#$

$f_b = 19,112.1(12)/165.313 = 1387.4$ PSI. < 1610 PSI

Bm A $W = 1/2(420) = 210$ OK, BY INSPECTION

DA

Ric

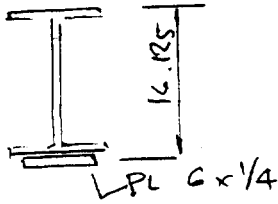
ENGINEERS

49 FALMOUTH ROAD
FALMOUTH, MAINE 04105
TELEPHONE (207) 781-3364
FAX (207) 781-3364
CELL PHONE (207) 233-7662

DAT # 8 of 10

11/3/05

BEAM W 16x40 w. PL. $I = 525.9$
 $A = 11.78$
 $S = 65.7$

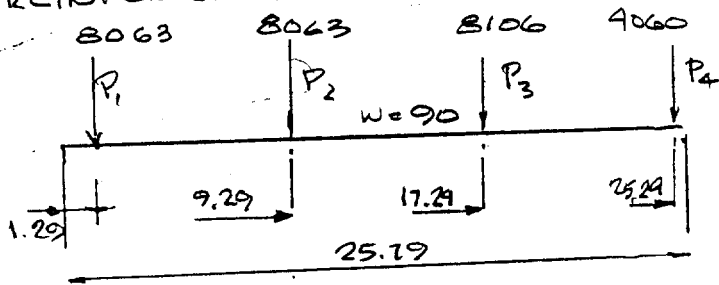


A	y	Ay
11.78	16.125	190.24
1.5		24.180
<u>13.28</u>		<u>118.420</u>

A	y^2	Ay^2	I_0
11.78	264.3	3109.27	525.9
1.5	51.941	77.911	<u>.008</u>
		<u>37.181</u>	<u>525.908</u>

$I_{TOTAL} = 613.089$
 $S = I/c = 613.089 / 8.918 = 68.747 \text{ in}^3$

REINFORCED W 16x40



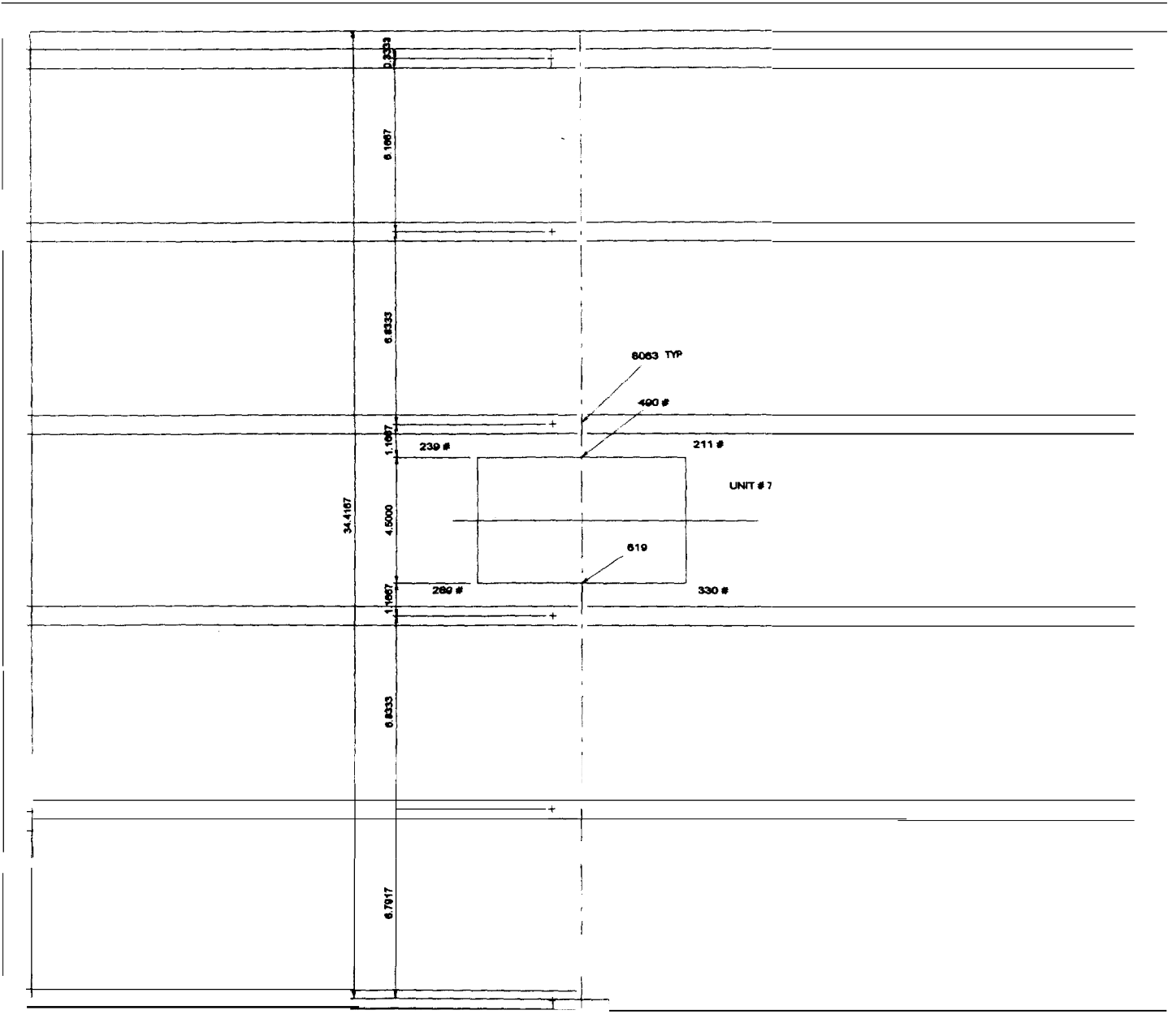
$R_L = 16,729$

$R_R = 13,884$

$V = 0$ AT P_2

$M_{MAX} = 87,026$

$f_b = 87026(12) / 68.747 = 15,191 < 20,000 \text{ OK}$



SALVATION ARMY
 30 WARREN AVE., PORTLAND, ME.
 UNIT # 7: OFFICE ROOF
 SH. # 9 of 10

OFFICE UNIT

ROOF L.L. = 42 PSF

DL:
 7 PSF ROOFING
 3" PLANK
 5 C.G. & LIGHTS
 15

TOTAL LOAD: 42 + 15 = 57 PSF

BEAMS @ 6'-10" O.C. 8x12

W = 6.83(57) + 20 = 409.5 PLF SAY 410

SPAN = 19'-4"

R = 19.33(410)(.5) = 3963# $f_p = 68.2 < 70$ OK

M = .125(410)(19.33)² = 19149.5#

S = 165.313

$f_b = 19149.5(12)/165.313 = 1390$ PSI

f_b EASTERN HEMLOCK

LOADS

P1 = -8.863,00
 dP1 = 6,79

P2 = -8.863,00
 dP2 = 6,83

P3 = -619,00
 dP3 = 1,17

P4 = -490,00
 dP4 = 4,50

P5 = -8.863,00
 dP5 = 1,17

P6 = -8.863,00
 dP6 = 6,83

P7 = -4.834188
 dP7 = 6,79

w1 = -80,00
 L1 = 34,42
 dW1 = 0,00

SPAN = 34,42

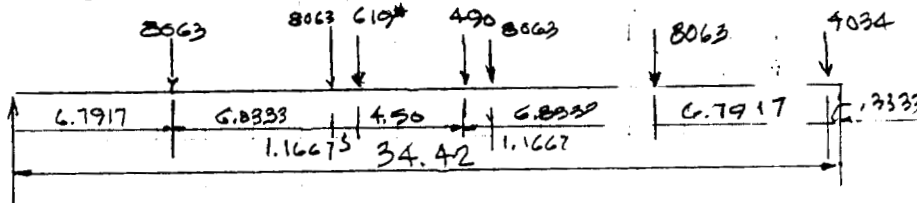
REACTIONS

LEFT = 18.266,21
 RIGHT = 21.882,13

MAX M

X = 19,1
 M = 188.238,69

STEEL BEAM: I 20x75 $d = 20, b_f = 6.25, t_f = 0.64$
 $S = 126.3$ IN³



$R_L =$

$R_R = 21882$

$M_{max} = 188,239$ #

$f_b = 188239(12)/126.3 = 17885$ PSI $F_b = 20,000$