Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

June 27, 1995

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. Tom Hess
Energy Systems
Air Products and Chemicals, Inc.
7201 Hamilton Boulevard
Allentown, Pennsylvania 18195-1501

RE: Orlando CoGen L.P.
AC48-206720

Dear Mr. Hess:

The Bureau of Air Regulation received your February 10 request to amend the above referenced permit. Before we can begin processing your request, we will need a $250 processing fee pursuant to Rule 62-4.050(4)(q)5., F.A.C. If you have any questions, please call Patty Adams at (904)488-1344.

Sincerely,

Patricia G. Adams

for C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/pa

cc: Martin Costello

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Tom Hess, Energy Syst.
Air Products & Chemicals
7201 Hamilton Blvd
Allentown, PA 18195-1501

4a. Article Number
Z 392 979 008

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
7-7-95

5. Signature (Addressee)
[signature]

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

Thank you for using Return Receipt Service.

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 RETURN RECEIPT

Z 392 979 008

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to: Tom Hess
Street and No.: Air Products & Chem
P.O., State and ZIP Code: Allentown, PA

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	Orlando Cosgn

AC4E-206720 6-28-95

PS Form **3800**, March 1993

al

HOPPING GREEN SAMS & SMITH
PROFESSIONAL ASSOCIATION
ATTORNEYS AND COUNSELORS
123 SOUTH CALHOUN STREET
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500
FAX (904) 224-8551
FAX (904) 425-3415

JAMES S. ALVES
BRIAN H. BIBEAU
KATHLEEN BLIZZARD
ELIZABETH C. BOWMAN
RICHARD S. BRIGHTMAN
PETER C. CUNNINGHAM
RALPH A. DEMEO
THOMAS M. DEROSE
WILLIAM H. GREEN
WADE L. HOPPING
FRANK E. MATTHEWS
RICHARD D. MELSON
DAVID L. POWELL
WILLIAM D. PRESTON
CAROLYN S. RAEPPLE
GARY P. SAMS
ROBERT P. SMITH
CHERYL G. STUART

KRISTIN M. CONROY
CONNIE C. DURRENCE
JONATHAN S. FOX
JAMES C. GOODLETT
GARY K. HUNTER, JR.
JONATHAN T. JOHNSON
ROBERT A. MANNING
ANGELA R. MORRISON
GARY V. PERKO
KAREN M. PETERSON
MICHAEL P. PETROVICH
DOUGLAS S. ROBERTS
LISA K. RUSHTON
R. SCOTT RUTH
JULIE R. STEINMEYER

OF COUNSEL
CARLOS ALVAREZ
W. ROBERT FOKES

February 22, 1995

RECEIVED
FEB 23 1995
Bureau of
Air Regulation

VIA HAND DELIVERY

Kenneth Plante, Esquire
Office of General Counsel
Department of Environmental Protection
2600 Blair Stone Road, Room 654
Tallahassee, FL 32399-2400

Re: Orlando CoGen (I), Inc.
Construction Permit No. AC48-206720, PSD-FL-184
Permit Amendment and Notice of Intent to Deny Requested Permit Revision
Orlando Central Park, Orange County, Florida
OGC Case No.: 94-2845

Dear Mr. Plante:

On August 18, 1994, Orlando CoGen (I), Inc., received the above-referenced notice of Intent to Deny a requested permit revision for its cogeneration facility located in Orange County, Florida. The Intent to Deny was issued by Howard L. Rhodes, Director of the Division of Air Resources Management, Department of Environmental Protection, on August 16, 1994. Subsequently, a Permit Amendment was issued by Mr. Rhodes on February 9, 1995, and received by Orlando CoGen, (I), Inc., on February 15, 1995. Pursuant to Section 120.57, Florida Statutes; Rule 62-103, Florida Administrative Code; and Orders of the Department dated September 21, 1994, November 7, 1994, and December 28, 1994, Orlando CoGen (I), Inc., has until February 28, 1995, to file a petition for administrative proceedings regarding the Intent to Deny and until March 1, 1995, regarding the Permit Amendment.

On behalf of Orlando CoGen (I), Inc., I hereby request, pursuant to Rule 62-103.070, F.A.C., an extension to and including May 1, 1995, in which to file a petition for administrative proceedings regarding the Permit Amendment and the Intent to Deny. As good cause for granting the request for extension of time for filing, Orlando CoGen (I), Inc., states the following:

1. Representatives of Orlando CoGen (I), Inc., have conferred and corresponded with the appropriate representatives of the Department's Bureau of Air Regulation regarding the Intent to Deny and the Permit Amendment in an effort to reach a mutually acceptable resolution of the requested permit revision. Much progress has been made through issuance of the permit amendment; a few issues remain, however. Orlando CoGen (I), Inc., will continue to work with the Department in an effort to resolve these few remaining issues.

2. This request is filed simply as a protective measure to avoid waiver of Orlando CoGen (I), Inc.'s right to challenge the Intent to Deny and the Permit Amendment. Grant of this request will not prejudice either party, but will further their mutual interest and likely avoid the need to initiate formal administrative proceedings.

3. I hereby certify that I have attempted without success to contact Douglas Beason of the Department's Office of General Counsel regarding this request to determine whether he would have an objection.

Accordingly, I hereby request that you formally extend the time for filing a petition for administrative proceedings regarding to the Department's Notice of Intent to Deny and the Permit Amendment for Air Construction Permit No. AC48-206720 and PSD-FL-184, to and including May 1, 1995.

Sincerely,

Angela R. Morrison

cc: Clair H. Fancy, P.E., Chief, BAR, DEP
Douglas Beason, Esquire, OGC, DEP
Ken Kosky, KBN
Tom Hess, Air Products and Chemicals, Inc.
Mark Novotnak, Orlando CoGen (I), Inc.

cc: Syed Arif

Air Products and Chemicals, Inc.
7201 Hamilton Boulevard
Allentown, PA 18195-1501

Telephone (610) 481-4911
Telex: 847416

AIR PRODUCTS

10 February 1995

RECEIVED
FEB 13 1995
Bureau of
Air Regulation

Mr. Bruce Mitchell
Florida Department of Environmental Protection
Air Resources Management
Twin Tours Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Orlando CoGen L.P. (AC48-206720) - particulate matter testing

Dear Mr. Mitchell:

As you requested yesterday in our telephone conversation, I am sending copies of two emission test reports for our Orlando CoGen plant (2-8 September 1994, and 2-3 November 1994 — both in one binder). The data from both reports are summarized in the attached table, which I had previously sent to you. Because one of the September particulate test runs yielded unlikely[1] results, the entire particulate test series was repeated in November.

Tests for NOx and CO were conducted simultaneously using the test ports at the inlet of the heat recovery steam generator, i.e., after the turbine exhaust but ahead of the duct burners, and at the stack (please see the process schematic diagram). However, tests for particulate emissions could only be conducted at the heat recovery steam generator (HRSG) stack. Simultaneous testing for particulate matter at the HRSG inlet and at the stack is not possible since isokinetic sampling conditions do not exist anywhere prior to the duct burners.

Sketch A shows an elevation of the HRSG at the point of turbine exhaust. Approximately six feet downstream of the turbine exhaust is the leading edge of the first of two inclined flow diffusers which extend vertically about three fourths of the height of the HRSG. Approximately two feet downstream of the second set of flow diffusers are the duct burners. As can be seen from the sketch, there is no unobstructed point to insert test probes between the turbine exhaust and the duct burners with the exception of the six feet immediately downstream of the turbine exhaust. This location is only suitable for gas concentration measurements since the required isokinetic sampling conditions for particulate are not present due to the swirling flow of the turbine exhaust. Further, no location upstream of the duct burners meets the minimum requirement of Method 1 that the sampling point be located at least two diameters downstream of the last "flow disturbance," the turbine exhaust into the HRSG. In fact, the only point in the plant where isokinetic sampling is physically possible is the boiler stack. This plant design is consistent will all similar units in the US.

---

[1] Particulate run 3, 9/2/94, in Table 2 of the test report yielded 0.0176 lbs/MMBtu$_{HHV}$ while the two prior runs were respectively: 0.0059 and 0.0051 lbs/MMBtu$_{HHV}$ (878 MMBtu/hr$_{HHV}$ turbine and 126 MMBtu/hr$_{HHV}$ duct burners). Also, while firing only the combustion turbine at 878 MMBtu/hr$_{HHV}$, the average of three PM tests was 0.0049 lbs/MMBtu$_{HHV}$. Because 5 of 6 test runs indicated PM emissions in the range of 0.0035 to 0.0072 lbs/MMBtu$_{HHV}$, the one value at 0.0176 lbs/MMBtu$_{HHV}$ was suspect. Consequently three additional particulate test runs were conducted on 11/2-3/1994 (Table 1) which yielded an average of 0.0082 lbs/MMBtu$_{HHV}$ at full combustion turbine and duct burner firing.

Based on the way the BACT determination for PM/PM_{10} was made, we do not believe there is any explicit permit condition or regulation that requires simultaneous testing for particulate. BACT for PM was determined to be good combustion of clean fuels, namely natural gas, the only fuel used at the facility. The emission standard was determined for both the combustion turbine **and** the duct burners to be 0.01 lbs/$MMBtu_{LHV}$. Moreover, the duct burners cannot be operated independently of the combustion turbine. The 0.01 lb/$MMBtu_{LHV}$ standard was then simply multiplied by the maximum heat input to each device to come up with separate emission limits for each device in units of pounds/hour (9 lbs/hr for the combustion turbine and 1.2 lbs/hr for the duct burners). Thus, the proposed emission rate for PM/PM_{10} treated the entire **combustion process** (duct burners and combustion turbine) as a single process. In fact, for ongoing compliance with particulate limits, an opacity standard is established by the permit. The Department concurred with this approval in its final BACT determination.

It must also be kept in mind that the duct burners cannot operate independently of the combustion turbine. The duct burners must be fired in series with the combustion turbine since the combustion turbine exhaust provides the oxygen for combustion of natural gas in the duct burners. There is no other source of combustion air for the duct burners. The plant has only two operating modes: combustion turbine firing alone, and combustion turbine firing with duct burner firing. There is no possible way to operate the duct burners without operation of the combustion turbine.

In interpreting the particulate test results for compliance determination, we believe that prorating the total emissions of particulate[2] between the combustion turbine and duct burners based on heat input is appropriate. This was the method by which the emission limits were established in the permit. We therefore request that the permit special conditions be amended to incorporate the following:

1) require all particulate testing at the stack location

2) require that meeting a total particulate standard of 0.01 lbs/$MMBtu_{LHV}$ is equivalent to 0.01 lbs/$MMBtu_{LHV}$ - duct burners and 0.01 lbs/$MMBtu_{LHV}$ - combustion turbine.

3) require determination of compliance with the specific pound/hr emission limits by prorating the total emissions, pounds/hr, between the combustion turbine and duct burners based on the heat input to each device as observed during the tests.

I hope this additional information will be of help. Please give me a call at 610 481-7620 if you have any questions.

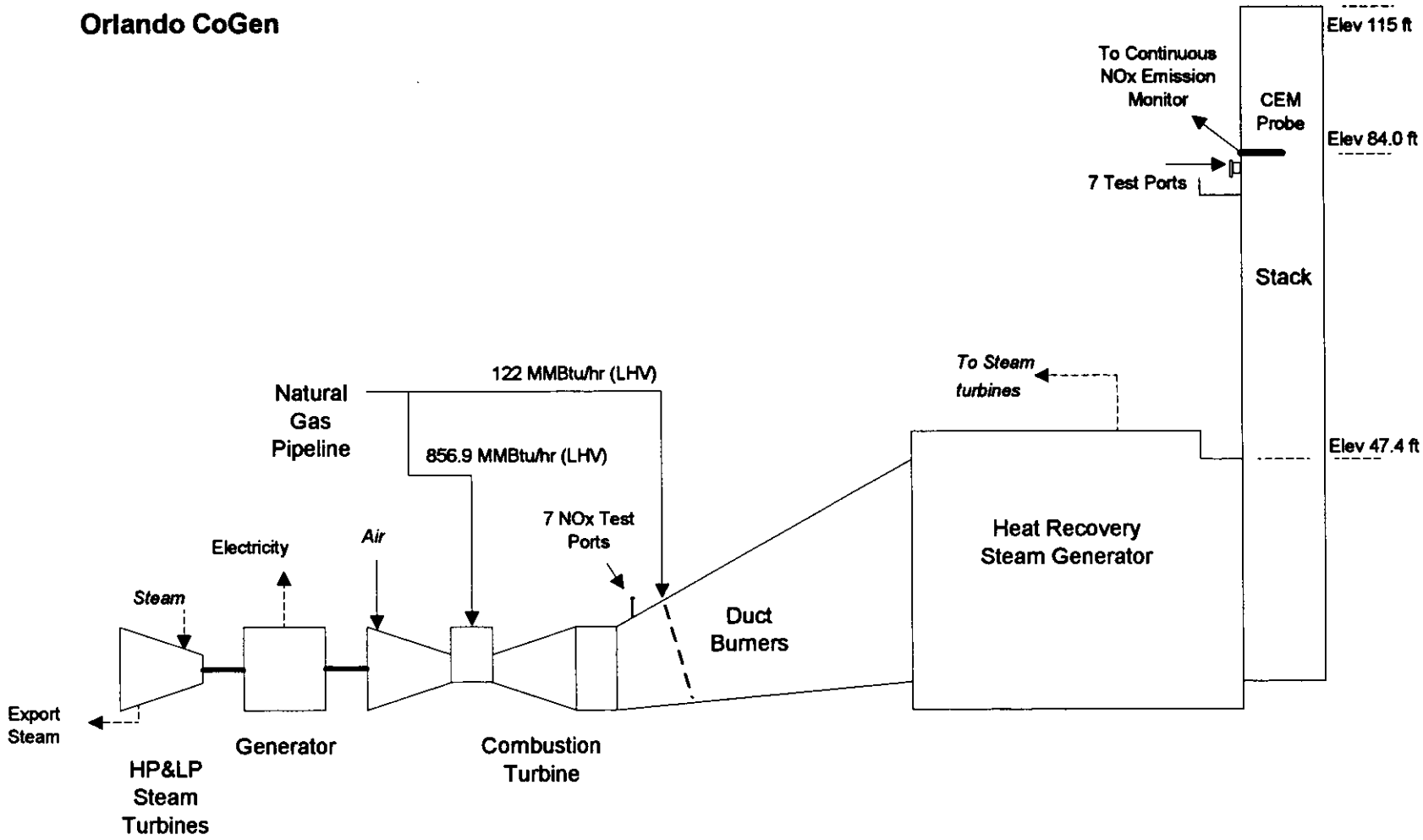
Very truly yours,

Tom Hess

Tom Hess
Energy Systems

[2] Particulate tests are conducted at the stack of the HRSG with both the combustion turbine and the duct burners at maximum firing.

Orlando CoGen



Orlando CoGen L.P. 128.9 MW Gas-Fired Combined Cycle Power Plant — Summary of Emission Performance Tests (1994)

	BACT Standard (emission limits)	9/2 Test Series, DB & CT full firing (simultaneous testing)	9/6 Test Series, CT only at full firing (Part GG max. load test)	11/2-3 Test Series, DB & CT full firing (simultaneous testing)
CT MMBtu/hr	856.9 LHV (ISO day)	789 LHV (839 ISO), 880 HHV	795 LHV (842 ISO), 887 HHV	822 LHV, 910 HHV
DB MMBtu/hr	122 LHV	113 LHV, 126 HHV	None	114 LHV, 126 HHV
CT NOx	15 ppmvd, 15% O_2 (57.4 lbs/hr)	14.4 ppmvd, 15% O_2 (46.6 lbs/hr)[1] RM 20 at CT exhaust	11.8 ppmvd, 15% O_2 (49.1 lbs/hr)[2] RM 2 & 20 at stack	
CT CO	10 ppmvd (22.3 lbs/hr)	0.33 ppmvd, 15.5% O_2 (0.71 lbs/hr)[3] RM 10 at CT exhaust	0.42 ppmvd, 15.4% O_2 (1.1 lbs/hr) RM 2 & 10 at stack	
CT PM/PM_{10}	0.01 lbs/MMBtu LHV (9.0 lbs/hr)	*0.0077 lbs/MMBtu LHV (6.1 lbs/hr)*[4,5] RM 5 & 2 at stack	0.00667 lbs/MMBtu LHV (5.2 lbs/hr)[a] RM 5 & 2 at stack	0.0090 lbs/MMBtu LHV[6] (7.4 lbs/hr) RM 5 & 2 at stack
DB NOx	0.1 lbs/MMBtu LHV (12.2 lbs/hr)	0.0446 lbs/MMBtu LHV[7] (5.0 lbs/hr)[8] RM 20 at stack	None	
DB CO	0.1 lbs/MMBtu LHV (12.2 lbs/hr)	0.0107 lbs/MMBtu LHV[9] (1.2 lbs/hr)[10] RM 10 at stack	None	
DB PM/PM_{10}	0.01 lbs/MMBtu LHV (1.2 lbs/hr)	*0.0077 lbs/MMBtu LHV (0.87 lbs/hr)*[4,5] RM 5 &2 at stack	None	0.0090 lbs/MMBtu LHV[6] (1.0 lbs/hr) RM 5 & 2 at stack
VE	0%	0%		

[1] Calculated from heat input to CT and NOx concentration of 0.0530 lbs NOx/MMBtu HHV.

[2] Rate determined by NOx concentration (Method 20) and stack gas flow rate (Method 2).

[3] Calculated from heat input to CT and CT CO concentration, 0.000807 lbs/MMBtu HHV.

[4] Three particulate runs were conducted at the stack (i.e. downstream of the duct burners for total PM emissions — PM from duct burners plus the combustion turbine) with these results: 7.68, 6.33, and 20.53 lbs/hr. Because the last run appeared to be an outlier, the entire test series was repeated on 11/2-3. The values given in italics ignore the third suspect run. The average particulate from the first two runs is prorated between the duct burner and combustion turbine based on their heat input.

[5] Reference Method 5 is specified in the permit, however it is not applicable to this source type nor is it physically possible to conduct a valid Method 5 test in the immediate vicinity of a turbine exhaust.

[a] Average heat input during the particulate test runs was 787 MMBtu/hr LHV

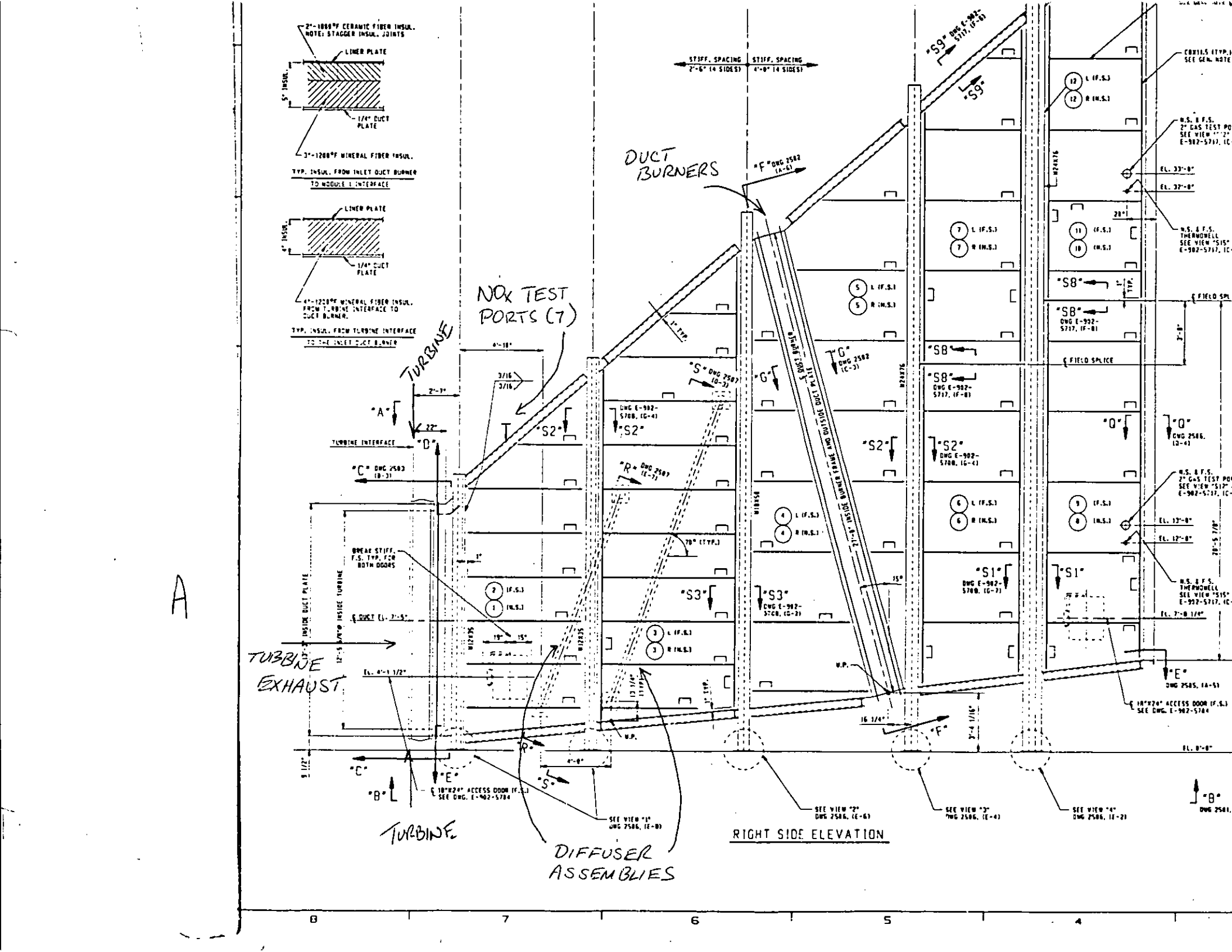
[6] Total particulate (duct burners plus combustion turbine contributing) using Methods 5 and 2 was determined at the stack. The total particulate rate measured was 8.45 lbs/hr (average of 7.58, 8.73, 9.03 lbs/hr). Emissions from the combustion turbine and duct burners were prorated from the total measured rate using the heat input to the duct burners and combustion turbine.

[7] Calculated using Method 19, $E_{Duct\ Burners}=E_{stack}+(CT_{heat\ input}/DB_{heat\ input})\cdot(E_{stack}-E_{turbine}) = 0.05146 + (880/126)\cdot(0.05146-0.05310) = 0.0400$ lbs/MMBtu HHV (0.0446 lbs/MMBtu LHV).

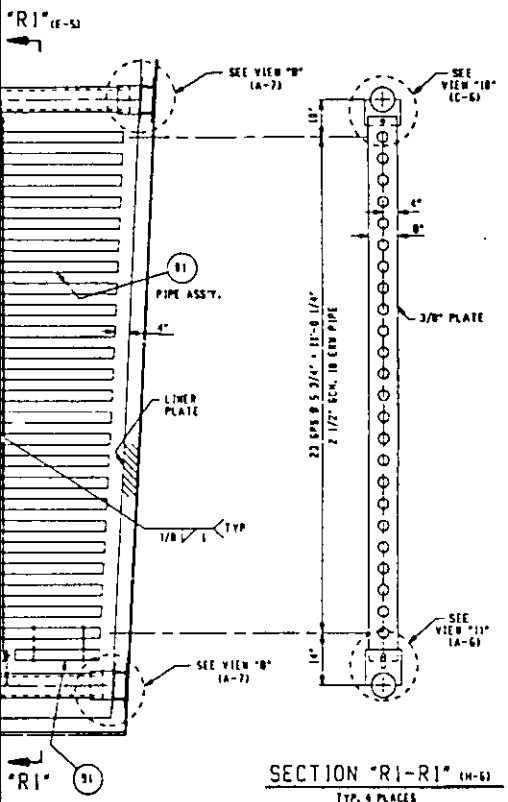
[8] Calculated using (7) $E_{Duct\ Burner}$ and duct burner heat input of 126 MMBtu/hr (LHV).

[9] Calculated using Method 19, $E_{Duct\ Burners}=E_{stack}+(CT_{heat\ input}/DB_{heat\ input})\cdot(E_{stack}-E_{turbine}) = 0.0019 + (880/126)\cdot(0.001946-0.0008) = 0.009600$ lbs/MMBtu HHV (0.0107 lbs/MMBtu LHV).

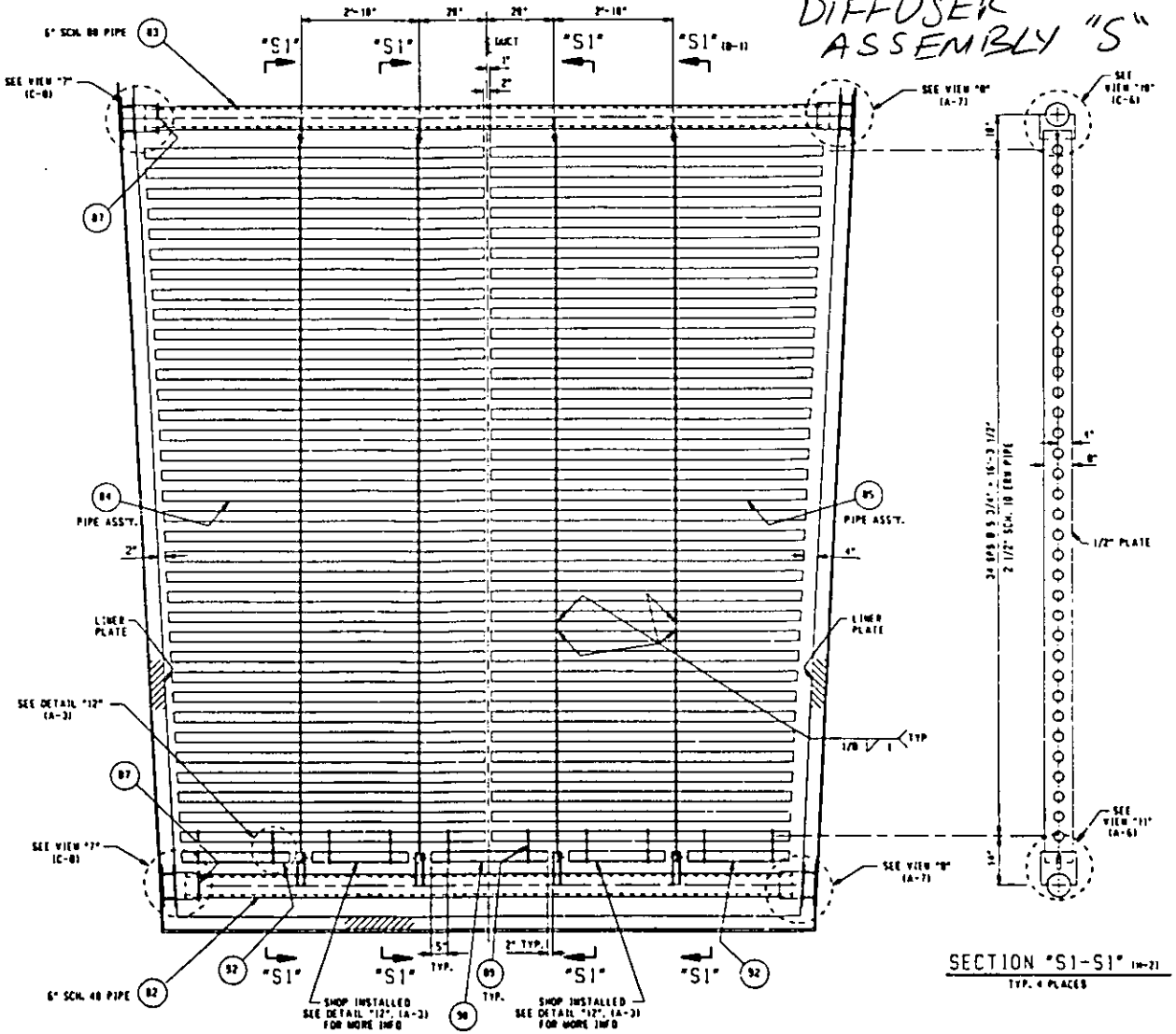
[10] Calculated from heat input to DB and DB CO concentration from (9), 0.0096 lbs/MMBtu LHV.


2"-1000°F CERAMIC FIBER INSUL. NOTE: STAGGER INSUL. JOINTS
LINER PLATE
5" INSUL.
1/4" DUCT PLATE
3"-1200°F MINERAL FIBER INSUL.
TYP. INSUL. FROM INLET DUCT BURNER TO MODULE 1 INTERFACE
LINER PLATE
4" INSUL.
1/4" DUCT PLATE
4"-1200°F MINERAL FIBER INSUL. FROM TURBINE INTERFACE TO DUCT BURNER.
TYP. INSUL. FROM TURBINE INTERFACE TO THE INLET DUCT BURNER
DUCT BURNERS
NOx TEST PORTS (7)
TURBINE
TURBINE EXHAUST
TURBINE
DIFFUSER ASSEMBLIES
STIFF. SPACING 2'-6" (4 SIDES)
STIFF. SPACING 4'-0" (4 SIDES)
"A"
"B"
"C"
"D"
"E"
"F"
"G"
"R"
"S"
"S1"
"S2"
"S3"
"S8"
"S9"
TURBINE INTERFACE
BREAK STIFF. F.S. TYP. FOR BOTH DOORS
SEE VIEW "1" DWG 2586, (E-8)
SEE VIEW "2" DWG 2586, (E-6)
SEE VIEW "3" DWG 2586, (E-4)
SEE VIEW "4" DWG 2586, (E-2)
RIGHT SIDE ELEVATION
8
7
6
5
4

DIFFUSER ASSEMBLY "S"

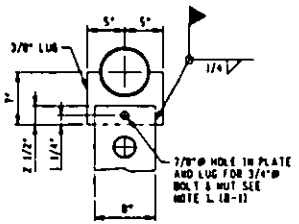


SECTION "R1-R1" (H-6)
TYP. 4 PLACES

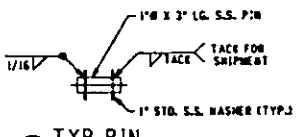


SECTION "S-S" DWG 2588, (D-6)

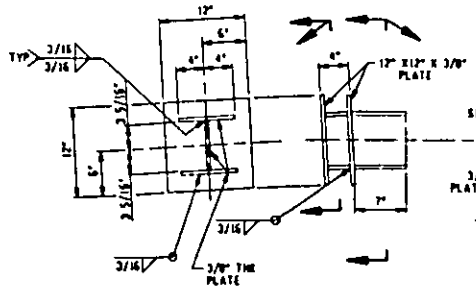
SECTION "S1-S1" (H-2)
TYP. 4 PLACES



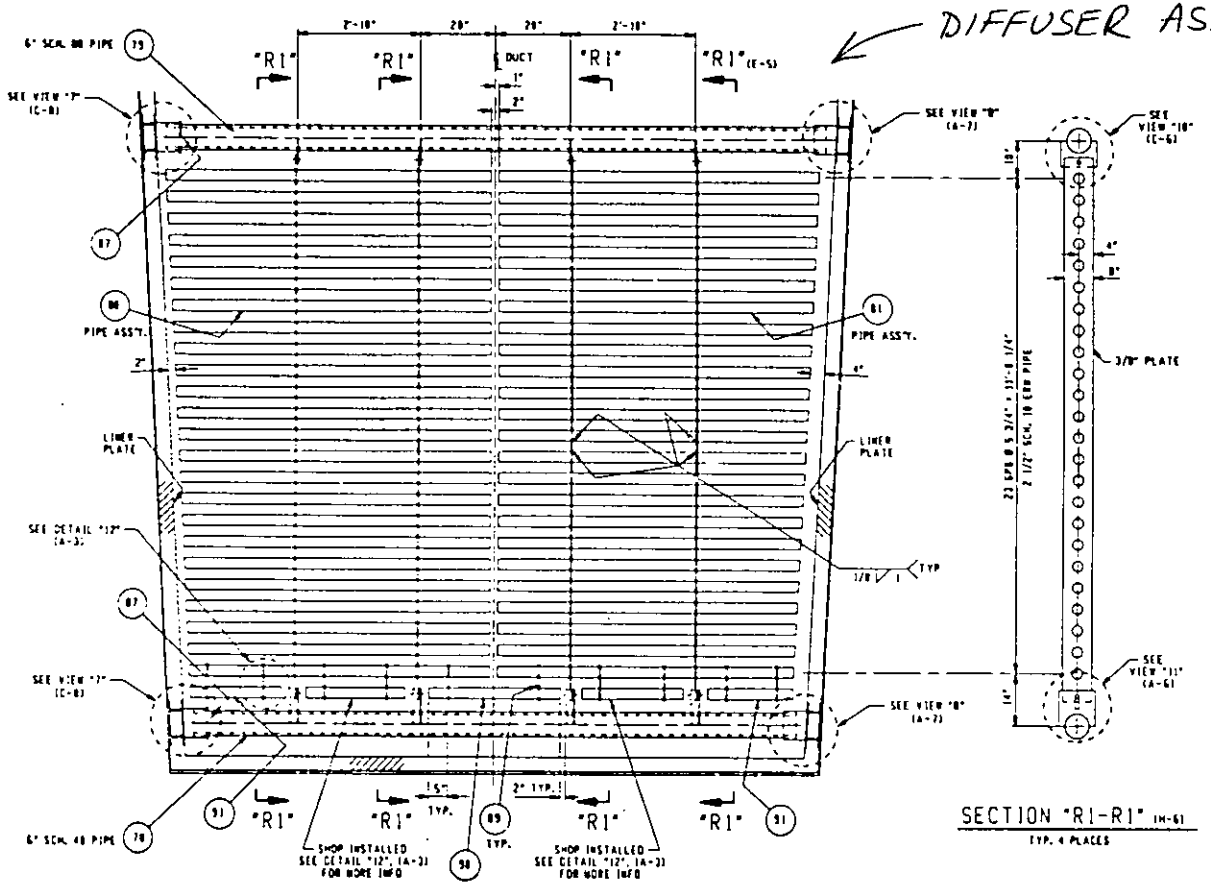
VIEW "10" (H-5) & (H-1)



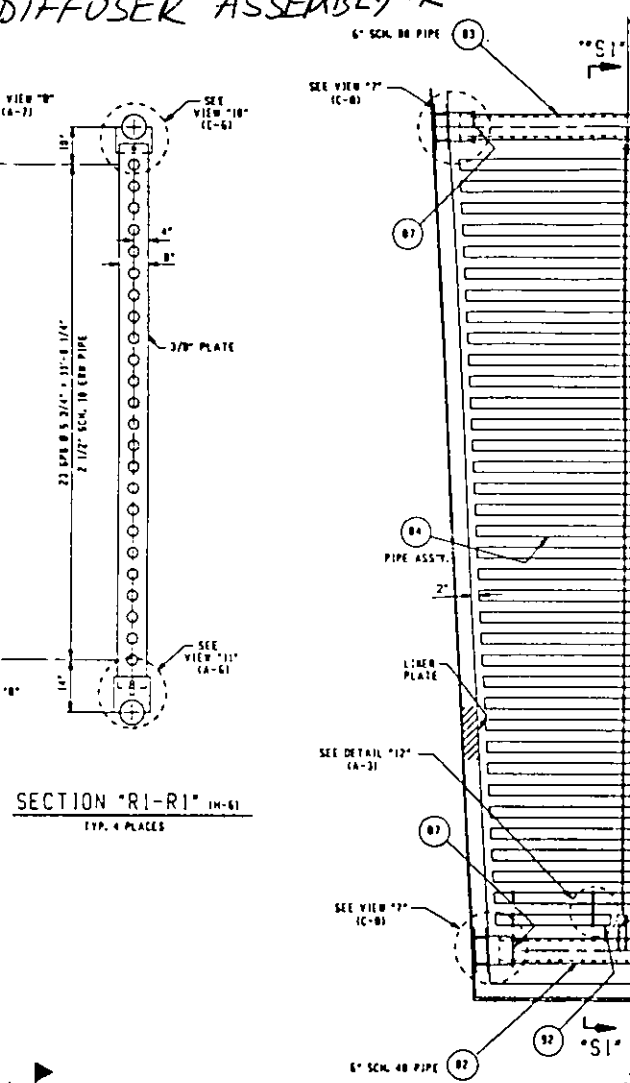
TYP PIN

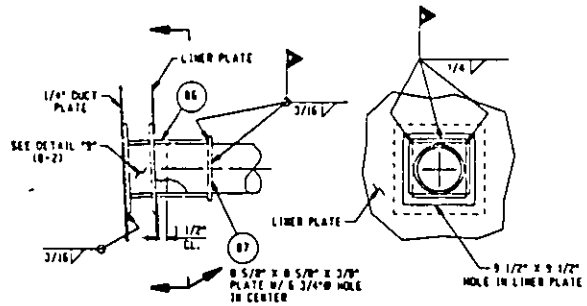


DIFFUSER ASSEMBLY "R"

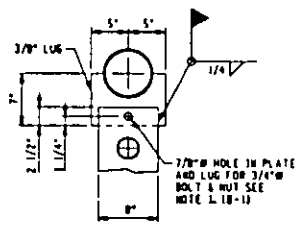


SECTION "R-R" DWG 2500, (D-6)

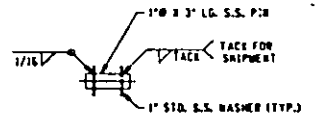




VIEW "7" (E-8), (H-8), (D-4) & (H-4)



VIEW "10" (H-5) & (H-1)



TYP PIN