Golder Associates Inc.

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February 4, 2004

Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Attention: A.A. Linero, P.E., Bureau of Air Regulation

RE: DEP File No. 0570008-044-AC; PSD-FL-336
CARGILL FERTILIZER, INC. - RIVERVIEW FACILITY, NO. 6 GRANULATION PLANT
RESPONSE TO REQUESTS FOR ADDITIONAL INFORMATION

Dear Mr. Linero:

Cargill Fertilizer, Inc. (Cargill) and Golder Associates Inc. (Golder) have received the Department's requests for additional information (RAIs) dated November 5, 2003, and November 14, 2003, concerning the permit no. 0570008-044-AC; PSD-FL-336 for modification of the No. 6 Granulation Plant (formerly EPP Plant). The comments are addressed below in the order they appear in each letter.

November 5, 2003 RAI

1. **Please provide sufficiently detailed drawings of the scrubber systems being relocated and the proposed new scrubbers to allow a proper engineering evaluation of their expected performance. Also provide sufficiently detailed engineering descriptions of the new and existing scrubbers including calculations of their design efficiencies for PM/PM_{10} and fluoride removal. [Rule 62-4.070(3), F.A.C., Standards for Issuance or Denial of Permits. Rule 62-212.400, F.A.C., Prevention of Significant Deterioration/Best Available Control Technology]**

   Response:
   Detailed drawings of the scrubber systems are included in Attachment A. The design of the emission control systems proposed by Cargill for this project are based on actual performance tests from the similar system in operation at Cargill's Green Bay North MAP/DAP Plant, rather than on theoretical design efficiencies.

   Cargill has previously submitted historic emissions test data for the North MAP/DAP Plant to the Department in conjunction with a PSD application for the Green Bay facility. As an update to the previously submitted test data, please refer to Tables A and B (attached), which revises the 10/26/99-10/27/99 MAP test data originally presented in Table 5-7 of Golder's October 1, 2003, letter regarding the Green Bay PSD application. These results represent total emissions from both the RG stack and the dryer/cooler/vents stack serving the North MAP/DAP Plant.

   The test data from the North MAP/DAP Plant supports Cargill's proposed limits of 0.04 lb/ton P_2O_5 for fluorides and 0.15 lb/ton P_2O_5 for PM. The highest compliance test for fluorides is 0.036 lb/ton. Allowing a 10 percent safety factor above this measured result yields a limit of 0.04 lb/ton. This proposed limit is also consistent (within round-off error) with the most stringent BACT determinations issued to date, which range from 0.037 to 0.042 lb/ton.

The highest compliance tests for PM at the North MAP/DAP Plant are above Cargill's proposed limit of 0.15 lb/ton. However, the majority of tests are below the 0.15-lb/ton level, and Cargill believes the improved equipment proposed for the No. 6 Granulation Plant can meet the proposed limit. This proposed limit is also consistent with the most stringent BACT determinations issued to date (0.15 lb/ton).

2. **Since the new scrubbing configuration involves removing the reactor/granulator tail gas scrubber, please provide sufficiently detailed engineering calculations of the relative PM/PM_{10} and fluoride removal efficiencies for two cases: (a) the ammonia vaporizer without a tailgas scrubber as proposed; and (b) the ammonia vaporizer exhaust being directed to the dryer tail gas scrubber. Also, please quantify the gaseous fluoride that will be stripped from the RGV Venturi Scrubber solution and the total fluoride removal effected by the recirculated condensate in the ammonia vaporizer. [Rule 62-4.070(3), F.A.C., Standards for Issuance or Denial of Permits. Rule 62-212.400, F.A.C., Prevention of Significant Deterioration/Best Available Control Technology]**

Response:
Please see the response to Item 1, above, for more discussion regarding fluoride emission performance of the proposed vaporizer scrubber. As indicated by the actual performance data from the similarly designed scrubber at the Green Bay facility, the proposed system is capable of achieving emission levels consistent with current BACT levels. A review of the Green Bay North Granulation Plant emission test results shows that the largest source of potential fluoride emissions (the Reactor/Granulator section) has lower emissions than the Dryer section of the plant. This is due to the superior performance of the vaporizer scrubbing system versus the conventional pond water packed scrubber.

November 14, 2003 RAI

1. **It appears there is a discrepancy in the proposed production rate increase for the AP Plant of 4000 TPD vs. 4478 TPD. Which one is correct?**

Response:
The correct AP production rate for the No. 6 Granulation Plant is 4,478 TPD.

2. **What is the capacity of the new Pipe Reactor and the new reactor that will replace Reactor Nos. 1 & 2? Submit design drawings and specifications of all the proposed new equipment.**

Response:
The capacity of the new Pipe Reactor is 40 percent of the total capacity, or 1,791 TPD AP. The capacity of the new reactor that will replace Reactor Nos. 1 and 2 is 60 percent of the total capacity, or 2,687 TPD AP. The design drawings and specifications are included in Attachment B.

3. **Please explain in details the mode of operation of this plant and the different processes (i.e.: GTSP, AP, and the phosphates fertilizers with added nitrogen, sulfur and micronutrients)?**

Response:
The modes of operation are described in detail in the following.

Ammoniated Phosphate (AP) modes:

DAP:

Diammonium Phosphate (DAP) fertilizer will be produced by a slurry process. This is done by mixing phosphoric acid with ammonia. The mixing will take place inside a preneutralizer and/or a pipe reactor (the preneutralizer and pipe reactor will run in parallel). For added flexibility, the preneutralizer or the pipe reactor can run independently of each other as well (i.e., one may be shut down for maintenance, while the other continues to produce product). Final ammoniazation will occur inside the granulator where both the preneutralizer's slurry and the pipe reactor's slurry discharge on top of the granulator's bed of recycle material. The ammonia sparger is buried in this bed of material.

The moist granules from the granulator are dried and screened. The product-sized material is cooled, while the undersized and crushed oversized granules are recycled.

When necessary to boost nitrogen grade, a 60-percent urea solution can be sprayed onto the product inside the rotary cooler.

Ammonia and dust escaping from the granulator, preneutralizer, and dryer circuits are recovered by scrubbing with phosphoric acid and this scrubber solution is added to the preneutralizer and/or pipe reactor.

MAP:

This process is similar to the DAP process with the exception that phosphoric acid may be sprayed in the granulator bed instead of ammonia. Less ammonia is used to produce monoammonium phosphate (MAP) than is used for DAP. Urea is not needed for grade control.

MicroEssentials™:

This process can be integrated into the ammoniated phosphate (AP) production processes mentioned above. Inclusion of nutrient sulfur and microelements is accomplished by adding sulfur and/or sulfuric acid along with several micronutrients in various combinations and concentrations.

The sulfur is added by a patented process in its molten state via a spray header inside the granulator. The sulfur then becomes incorporated into the fertilizer granules.

Sulfur grade may also be increased by mixing sulfuric acid with ammonia, either in the preneutralizer or pipe reactor, to make ammonium sulfate. The ammonium sulfate becomes a part of the reactor slurry, which in turn is incorporated into the fertilizer granules.

Micronutrients can be added one of two ways. They may be slurried with phosphoric acid and then pumped to the preneutralizer or the pipe reactor; or micronutrients may be added dry to the recycle stream. Both methods result in the micronutrients being incorporated within the fertilizer granules.

4. **Your application states that fluoride (F) emissions from the No. 2 and No. 4 building will not be increased since they stored GTSP and this production rate is not increased by this project. Since the AP production rate will increase, would it be any increase of F in the building as a result of storing AP? (Refer to Sections 2.2.5 and 2.22.7 of the PSD report)**

Response:

The F emission limit for the GTSP Storage Building Nos. 2 and 4 applies solely due to the storage of GTSP. This is because GTSP has a high F content. However, the GTSP Storage Buildings

Nos. 2 and 4 do not have an F limit for the storage of AP because AP emits very minimal amounts of F emissions during storage. Since the GTSP production rate is not increasing as part of this project, the F emissions from the GTSP Storage Buildings will not increase.

5. **Since the facility expansion permitted in 2001 has not been completed, recalculate Table 3-3 of the application using actual emission data for the last 2 years of operation. The GTSP plant and the other affected units are existing emission units that have been operating for several years. Therefore, actual emissions data should be used in this calculation.**

Response:
The construction authorized under Permit No. 0570008-036-AC is not completed. This permit authorized construction activities for the following emission units:

- Molten Sulfur Handling System
- Nos. 8 and 9 Sulfuric Acid Plants
- Phosphoric Acid Plant
- GTSP Plant (renamed the EPP Plant; now called No. 6 Granulation Plant)
- AFI Plant No. 1
- AFI Plant No. 2
- No. 5 DAP Plant (now called No. 5 Granulation Plant)

PSD review was triggered for the following pollutants in the facility-wide PSD permit: fluorides, SO_2, NO_x, PM, PM_{10}, and sulfuric acid mist.

Table 3-3 of the application included the Phosphoric Acid Plant, EPP Plant, Material Handling System, and the new Molten Sulfur Tank as "affected" emission units. The Phosphoric Acid Plant completed construction under the 2001 facility-wide permit with the compliance testing conducted on April 3, 2003. The EPP Plant is still undergoing construction related to the 2001 facility-wide permit. The plant is not yet operating at the higher production rate of 52 TPH to 100 TPH. The new Molten Sulfur Tank has not yet been completed. Since construction is not complete on these units, Cargill has not begun "normal" operation with these modified emissions units.

In the PSD rules, "actual emissions" are defined several ways. Per Rule 62-210.200(11)(c) and 40 CFR 51.166(21)(iv), actual emissions for an emissions unit that has not begun normal operation on the particular date shall equal the potential-to-emit of the emissions unit on that date. Since these emissions units have not begun normal operation as of the date of the No. 6 Granulation Plant application, by rule the potential emissions are used to represent the past "actual emissions" of these modified emissions units.

Furthermore, since actual emissions from the previous 2 years of operation do not reflect the normal operation of these modified emissions units under Permit No. 0570008-036-AC, it would not be appropriate to use the actual emissions for the years 2002-2003 to represent these emissions units. Therefore, it is justified to use the potential emissions from Permit No. 0570008-036-AC as the "actual emissions" in Tables 2-4 and 3-3.

Moreover, the allowable or maximum emissions shown in Table 3-3 as the past actual emissions for these emissions units have already undergone PSD review (in the 2001 facility-wide PSD permit). Requiring the 2002-2003 actual emissions to be used for these emissions units would, in essence, treat the 2001 PSD permit as if it never existed. The emissions that have already been approved would now be re-reviewed (i.e., double jeopardy).

Cargill therefore believes it is appropriate to use, in Table 3-3, the allowable or maximum emissions approved in the 2001 facility-wide PSD permit as "past actual emissions" for the Phosphoric Acid Plant, EPP Plant, and Molten Sulfur Tank. Golder also believes that this is appropriate according to the PSD regulations.

6. **Are the potential F emissions as a result of this modification 15.04 TPY or 22.46 TPY? It appears that the GTSP emissions (7.42 TPY) are not counted (Refer to Page 19—Section G of the application and Table 3-3 of the PSD report). Please explain.**

Response:
The maximum potential F emissions as a result of the modification are 3.43 lb/hr and 15.04 TPY as stated in the application. Since GTSP and AP are not produced simultaneously, it is not appropriate to add the maximum potential emissions resulting from production of AP (15.04 TPY) to the maximum potential emissions resulting from production of GTSP (7.42 TPY). The No. 6 Granulation Plant produces either AP or GTSP at a given time. Therefore, the maximum potential emissions at a given time would result from the product (AP or GTSP) that was being produced during that time. To estimate the maximum potential emissions for the No. 6 Granulation Plant, the maximum potential emissions resulting from the production of AP and GTSP were calculated separately. Therefore, the maximum potential F emissions for the proposed project were based on the worst-case emissions from AP production.

7. **Are the potential PM/PM_{10} emissions as a result of this modification 19.82/19.58 or 84.20 TPY? It appears that the total GTSP and AP emissions (56.39 + 27.81 TPY) are not counted (Refer to Page 19—Section G of the application and Table 3-3 of the PSD report). Please explain.**

Response:
The maximum potential PM/PM_{10} emissions as a result of the modification are 12.88 lb/hr and 56.39 TPY as stated in the application. As stated in response no. 6 above, since GTSP and AP are not produced simultaneously, it is not appropriate to add the maximum potential emissions resulting from production of AP (56.39 TPY) to the maximum potential emissions resulting from production of GTSP (27.81 TPY). The No. 6 Granulation Plant produces either AP or GTSP at a given time. Therefore, the maximum potential emissions at a given time would result from the product (AP or GTSP) that was being produced during that time. To estimate the maximum potential emissions for the No. 6 Granulation Plant, the maximum potential emissions resulting from the production of AP and GTSP were calculated separately. Therefore, the maximum potential PM/PM_{10} emissions for the proposed project were based on the worst-case emissions from AP production.

8. **Your application states that the GTSP plant is not subject to the NSPS, Subpart W requirements due to this modification (Page 3-11). Please explain.**

Response:
The NSPS, Subpart W applies to facilities that commence construction or modification after October 22, 1974. The No. 6 Granulation Plant (formerly GTSP Plant) was constructed prior to October 22, 1974. The NSPS General Provisions (40 CFR 60 Subpart A) define "modification" as:

> *Any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.*

The NSPS General Provisions (40 CFR 60 Subpart A) also defines "emission rate" for a modification as:

> *Emission rate shall be expressed as kg/hr of any pollutant discharged into the atmosphere for which a standard is applicable.*

The proposed modification of the No. 6 Granulation Plant does not meet this NSPS definition of modification since the actual emissions are not increasing on a lb/hr basis for the pollutant for which the standard applies (F emissions from GTSP production). This is because the GTSP production rate is not being modified as part of the proposed project. Therefore, since the No. 6 Granulation Plant was neither constructed or modified after October 22, 1974, the NSPS, Subpart W does not apply to the No. 6 Granulation Plant.

9. **Please redo any significant impact area modeling due to emissions changes as a result of recalculations required by comment number 5 above. Also update Table 6-3 to reflect the use of actual emissions. If the significant impact area changes for PM_{10}, then further applicable AAQS and increment modeling should be done. If current versus future fluoride impacts change, these changes should be updated in Tables 6-16 and 6-17. If pollutant applicability changes and other pollutants are subject to PSD, then all required modeling associated with those pollutants should be performed. In addition, if the emission changes impact the regional haze analysis, it needs to be updated.**

Response:
As explained in comment No. 5 above, it is not appropriate to revise the emissions. Therefore, it is not necessary to revise the modeling analyses.

If you have any questions concerning this information, please call me at (352) 336-5600 or Dean Ahrens, Cargill, at (813) 671-6369.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff

David A. Buff, P. E., Q. E. P.
Principal Engineer
Florida P. E. #19011
SEAL

DB/FWB/jej

Enclosures

cc: D. Ahrens, Cargill
F. Bergen, Golder
A. Harmon, HCEPC
D. Jellerson, Cargill
G. Kissel, FDEP SW District
B. Culp
Y:\Projects 2002 0237575 Cargill Riverview\4\4.1\020404\L020404.doc
C. Holladay
B. Harley, EPA
A. Bumpod, UPS

Table A. Summary of Recent Particulate Matter Emission Tests at the North MAP/DAP Fertilizer Plant, Cargill Green Bay

Date	Average Production Rate[a] (tons/hr)	Average Process Rate[b] (tons/hr)	PM Emissions[c] avg lb/hr	PM Emissions[c] avg lb/ton P_2O_5
MAP Production				
8/1/02-8/2/02	160.4	81.8	10.19	0.125
3/27/01-3/28/01	167.3	85.3	8.44	0.099
3/16/00-3/17/00	148.6	75.8	16.99	0.224
3/16/00-3/20/00	150.1	76.6	11.75	0.154
10/26/99-10/27/99	139.7	71.3	9.07	0.127
6/30/99-7/2/99	143.5	73.2	6.90	0.094
4/12/99-4/14/99	158.0	80.6	6.77	0.084
DAP Production				
5/1/02-5/2/02	94.8	43.6	14.02	0.322
2/13/01-2/14/01	106.0	48.8	7.24	0.148
4/6/00-4/7/00	97.9	45.1	3.03	0.067
3/17/99-3/18/99	94.9	43.7	2.02	0.046
1/20/99-1/21/99	94.0	43.3	5.12	0.118
1/26/98-1/29/98	99.3	45.7	7.90	0.173

[a] As MAP or DAP. Based on 51% P_2O_5 for MAP and 46% P_2O_5 for DAP.

[b] As P_2O_5.

[c] Represents both stacks combined.

Table B. Summary of Recent Fluoride Emission Tests at the North MAP/DAP Fertilizer Plant, Cargill Green Bay

Date	Average Production Rate[a] (tons/hr)	Average Process Rate[b] (tons/hr)	R/G Stack Emissions avg lb/hr	R/G Stack Emissions avg lb/ton P_2O_5	Dryer Stack Emissions avg lb/hr	Dryer Stack Emissions avg lb/ton P_2O_5	Total F Emissions[c] avg lb/hr	Total F Emissions[c] avg lb/ton P_2O_5
MAP Production								
8/1/02-8/2/02	160.4	81.8	0.27	0.0033	0.54	0.0066	0.81	0.0099
3/27/01-3/28/01	167.3	85.3	0.43	0.0050	0.50	0.0058	0.93	0.0108
3/16/00-3/17/00	148.6	75.8	0.12	0.0016	1.09	0.0144	1.21	0.0160
3/16/00-3/20/00	150.1	76.6	1.23	0.0160	0.33	0.0043	1.55	0.0203
10/26/99-10/27/99	139.7	71.3	1.17	0.0164	0.64	0.0090	1.80	0.0253
6/30/99-7/2/99	143.5	73.2	0.63	0.0086	2.01	0.0275	2.64	0.0361
4/12/99-4/14/99	158.0	80.6	1.05	0.0130	0.92	0.0114	1.97	0.0244
DAP Production								
5/1/02-5/2/02	94.8	43.6	0.03	0.0008	1.02	0.0235	1.06	0.0242
2/13/01-2/14/01	106.0	48.8	0.12	0.0024	0.90	0.0185	1.02	0.0209
4/6/00-4/7/00	97.9	45.1	0.18	0.0040	0.10	0.0022	0.28	0.0061
3/17/99-3/18/99	94.9	43.7	0.02	0.0004	0.69	0.0158	0.71	0.0162
1/20/99-1/21/99	94.0	43.3	0.06	0.0013	0.50	0.0116	0.56	0.0129
1/26/98-1/29/98	99.3	45.7	0.25	0.0056	0.57	0.0125	0.83	0.0181

[a] As MAP or DAP. Based on 51% P_2O_5 for MAP and 46% P_2O_5 for DAP.

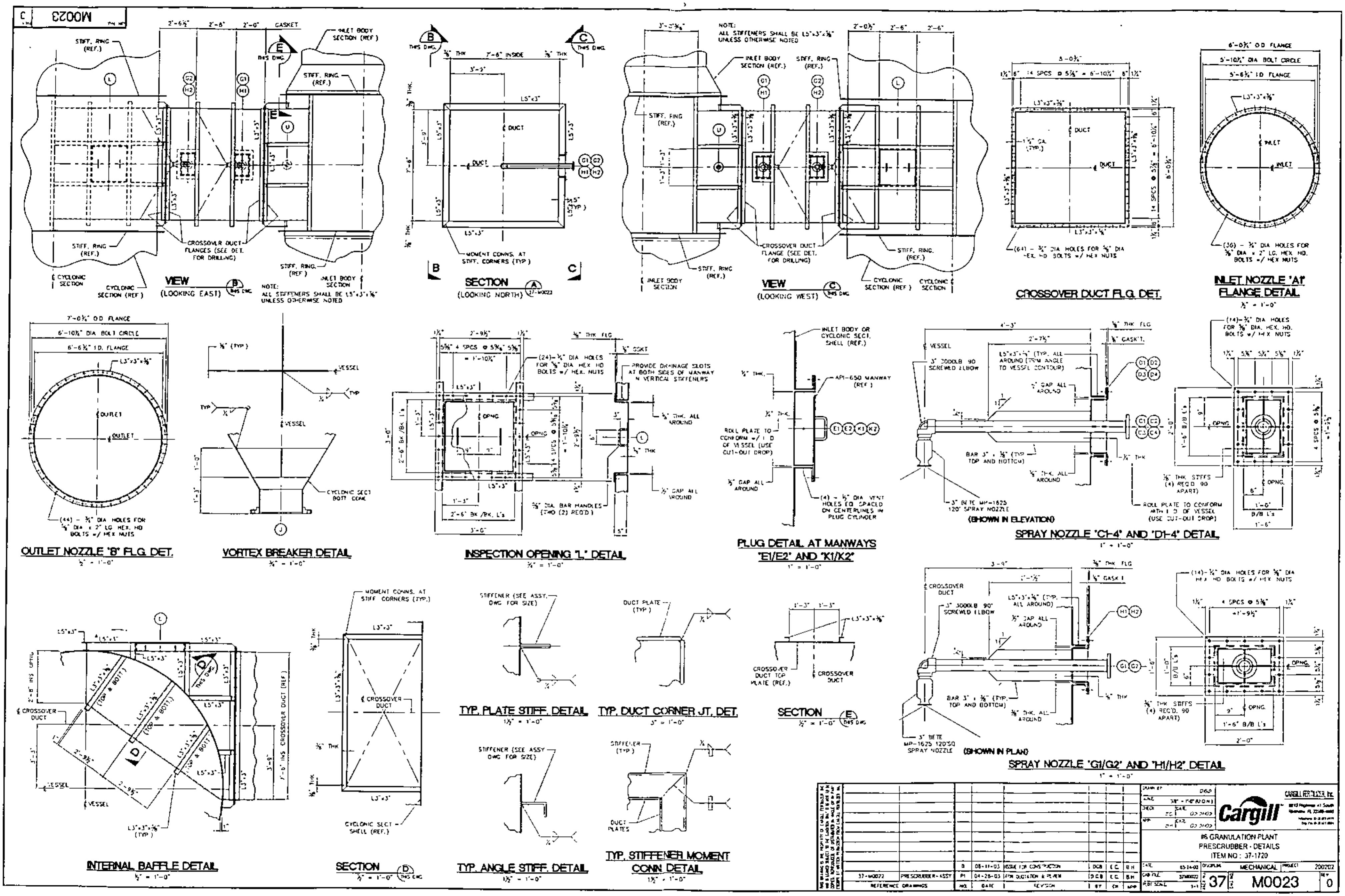
[b] As P_2O_5.

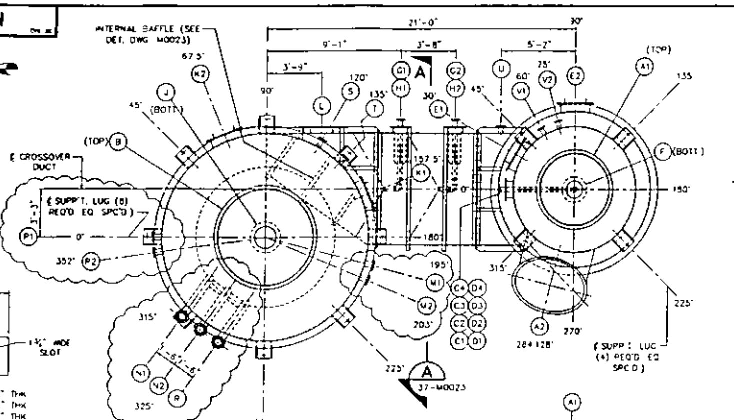
[c] Represents both stacks combined.

ATTACHMENT A

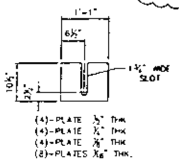
Attachment A, List of Attachments

Drawing Number	Drawing Title
37 M0023 0	No. 6 Granulation Plant Prescrubber-Details
37 M0022 2	No. 6 Granulation Plant Prescrubber-Assembly
37 M0021 0	No. 6 Granulation Plant Cooler Venturi Scrubber-Details
37 M0020 0	No. 6 Granulation Plant Cooler Venturi Scrubber-Assembly
37 M0025 0	No. 6 Granulation Plant Dryer Scrubber-Details
37 M0024 0	No. 6 Granulation Plant Dryer Scrubber-Assembly
37 M0027 0	No. 6 Granulation Plant RGV Scrubber-Details
37 M0026 1	No. 6 Granulation Plant RGV Scrubber-Assembly
37 M0057 0	No. 6 Granulation Plant Dryer Scrubber-Adjustable Throat Venturi Details
37 M0058 0	No. 6 Granulation Plant RGV Scrubber-Adjustable Throat Venturi Details
37 M0015 P1	No. 6 Granulation Plant Dryer Tailgas Scrubber-Modification Details
32-M-328	GTSP Plant Dryer Tailgas Scrubber Plan, Elevation, & Details
32-M-333	GTSP Plant Dryer Tailgas Scrubber-Scrubber Details & Sections

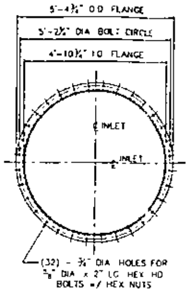

M0023
VIEW (LOOKING EAST)
NOTE: ALL STIFFENERS SHALL BE L5"x3"x⅜" UNLESS OTHERWISE NOTED
SECTION (LOOKING NORTH)
NOTE: ALL STIFFENERS SHALL BE L5"x3"x⅜" UNLESS OTHERWISE NOTED
VIEW (LOOKING WEST)
CROSSOVER DUCT FLG. DET.
INLET NOZZLE "A1" FLANGE DETAIL
OUTLET NOZZLE "B" FLG. DET.
VORTEX BREAKER DETAIL
INSPECTION OPENING "L" DETAIL
PLUG DETAIL AT MANWAYS "E1/E2" AND "K1/K2"
SPRAY NOZZLE "C1-4" AND "D1-4" DETAIL
INTERNAL BAFFLE DETAIL
SECTION D
TYP. PLATE STIFF. DETAIL
TYP. DUCT CORNER JT. DET.
SECTION E
TYP. ANGLE STIFF. DETAIL
TYP. STIFFENER MOMENT CONN. DETAIL
SPRAY NOZZLE "G1/G2" AND "H1/H2" DETAIL
Cargill
#6 GRANULATION PLANT
PRESCRUBBER - DETAILS
ITEM NO.: 37-1720
MECHANICAL
37
M0023
0
37-M0072 PRESCRUBBER - ASSY
REFERENCE DRAWINGS
0 08-11-03 ISSUE FOR CONSTRUCTION
P1 04-28-03 FOR QUOTATION & REVIEW



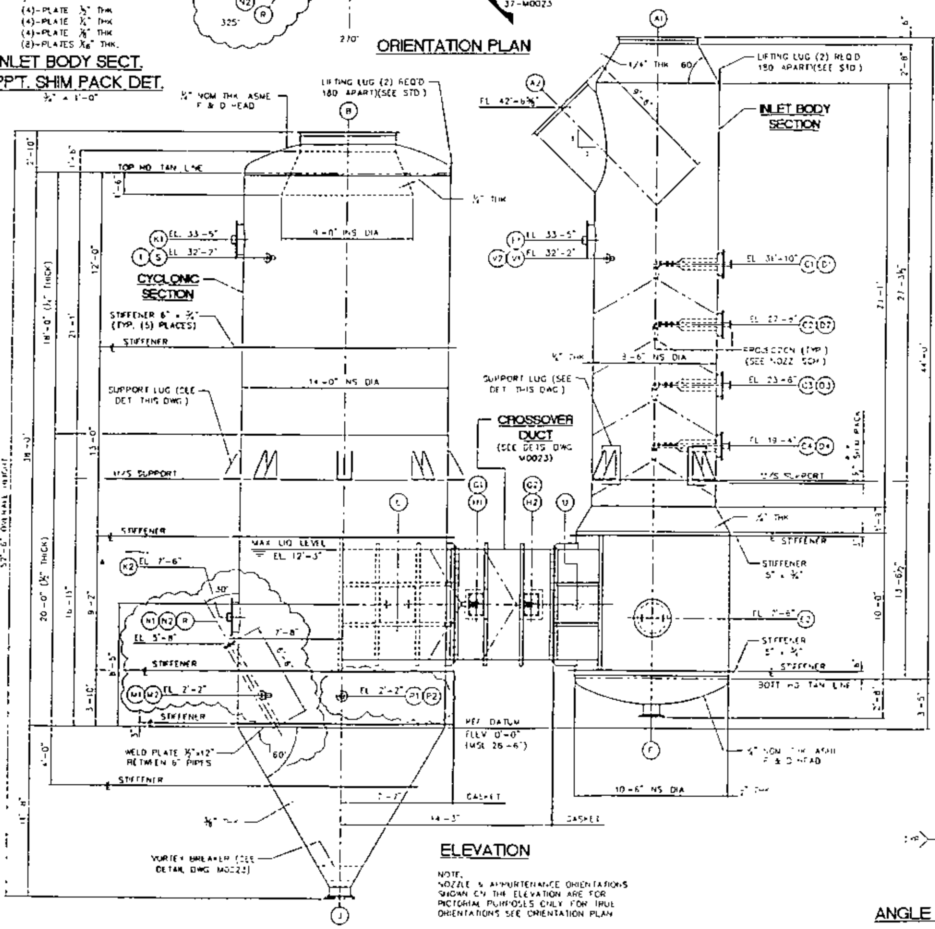
ORIENTATION PLAN



INLET BODY SECT. SUPP'T. SHIM PACK DET.
½" = 1'-0"



INLET NOZZLE "A2" FLANGE DETAIL
½" = 1'-0"



ELEVATION

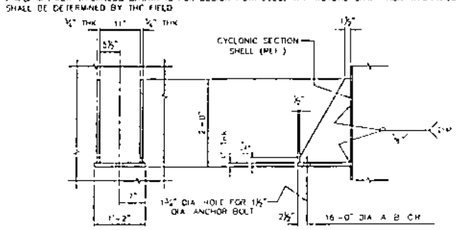
NOTE: NOZZLE & APPURTENANCE ORIENTATIONS SHOWN ON THE ELEVATION ARE FOR PICTORIAL PURPOSES ONLY. FOR TRUE ORIENTATIONS SEE ORIENTATION PLAN

NOZZLE SCHEDULE

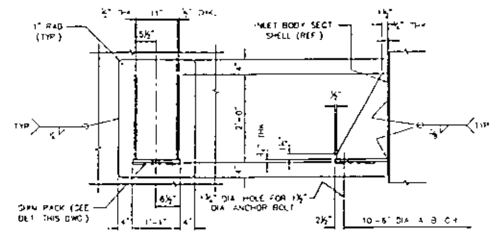
CONN	QTY	SIZE	CLASS/ FLG FACE	SERVICE	NECK THICK	PROJECTION	REMARKS
A1	1	66"	L3"x3"x⅜"	VAPOR INLET	⅜" THK	SEE DWG	DET DWG M0023
A2	1	59"	L3"x3"x⅜"	VAPOR INLET	⅜" THK	SEE DWG	DET. THIS DWG
B	1	78"	L3"x3"x⅜"	VAPOR OUTLET	⅜" THK.	SEE DWG	DET DWG M0023
C1	1	3"	CL150/SO,RF	INLET BODY SPRAY	SCH 40S	5'-3"	DET DWG M0023
C2	1	3"	CL150/SO,RF	INLET BODY SPRAY	SCH 40S	5'-3"	DET. DWG M0023
C3	1	3"	CL150/SO,RF	INLET BODY SPRAY	SCH 40S	5'-3"	DET DWG M0023
C4	1	3"	CL150/SO,RF	INLET BODY SPRAY	SCH 40S	5'-3"	DET DWG M0023
D1	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C1"	-----	SEE DET	DET. DWG M0023
D2	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C2"	-----	SEE DET	DET DWG M0023
D3	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C3"	-----	SEE DET	DET DWG M0023
D4	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C4"	-----	SEE DET	DET DWG M0023
E1	1	24"	PER API-650	INLET BODY SHELL MANWAY	PER CODE	PER CODE	NOTE "8" & DET M0023
E2	1	24"	PER API-650	INLET BODY SHELL MANWAY	PER CODE	PER CODE	NOTE "8" & DET M0023
F	1	14"	CL150/SO,RF	INLET BODY DRAIN	STD WT	SEE DWG	
G1	1	3"	CL150/SO,FF	CROSSOVER DUCT SPRAY	SCH 40S	4'-9"	DET DWG M0023
G2	1	3"	CL150/SO,FF	CROSSOVER DUCT SPRAY	SCH 40S	4'-9"	DET DWG M0023
H1	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "G1"	-----	SEE DET	DET DWG M0023
H2	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "G2"	-----	SEE DET	DET DWG M0023
J	1	18"	CL150/SO,RF	CYCLONIC SECTION DRAIN	STD. WT	SEE DWG	
K1	1	24"	PER API-650	CYCLONIC SECT SHELL M W	PER CODE	PER CODE	NOTE "8" & DET M0023
K2	1	24"	PER API-650	CYCLONIC SECT SHELL M W	PER CODE	PER CODE	NOTE "8" & DET M0023
L	1	30"x30"	L5"x3"x⅜"	CROSSOVER DUCT INSP OPNG	-----	-----	NOTE "8" & DET M0023
M1	1	3"	CL150/SO,RF	ACID INLET	SCH. 40S	7'-8"	
M2	1	3"	CL150/SO RF	ACID INLET	SCH 40S	7'-8"	
N1	1	6"	CL150/SO RF	LEVEL GAGE MOUNT	SCH 40S	SEE DWG	
N2	1	6"	CL150/SO RF	LEVEL GAGE MOUNT	SCH 40S	SEE DWG	
P1	1	4"	CL150/SO RF	SCRUBBER LIQUOR INLET	SCH 40S	7'-8"	
P2	1	4"	CL150/SO,RF	SCRUBBER LIQUOR INLET	SCH 40S	7'-8"	
R	1	6"	CL150/SO,RF	DENSITY GAGE MOUNT	SCH 40S	SEE DWG	
S	1	3"	CL150/SO,RF	LEVEL GAGE BALANCE MOUNT	SCH 40S	7'-8"	NOTE "11"
T	1	3"	CL150/SO,RF	SAMPLE PORT	SCH 40S	7'-8"	NOTE "11"
U	1	3"	CL150/SO,RF	SAMPLE PORT	SCH 40S	4'-4"	NOTE "11"
V1	1	3"	CL150/SO RF	SAMPLE PORT	SCH 40S	4'-10"	NOTE "11"
V2	1	3"	CL150/SO,RF	SAMPLE PORT	SCH 40S	4'-10"	NOTE "11"

GENERAL NOTES

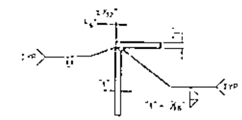
1. NOZZLE BOLT HOLES SHALL STRADDLE NATURAL NORTH/SOUTH VESSEL CENTERLINES OR THEIR PARALLELS UNLESS OTHERWISE NOTED
2. ALL NOZZLE PROJECTIONS ARE TO THE FACE OF THE STEEL FLANGE.
3. SHELL NOZZLE PROJECTIONS ARE MEASURED FROM CENTER OF VESSEL OR CROSSOVER DUCT TO FLG. FACE.
4. HEAD NOZZLE PROJECTIONS ARE MEASURED FROM THE HEAD TANGENT LINE TO FLANGE FACE
5. FABRICATOR SHALL FURNISH AND INSTALL ALL PARTS UNLESS OTHERWISE NOTED
6. * INDICATES VENDOR TO VERIFY OR SPECIFY
7. COMPLETE WITH BLIND FLANGE, BOLTS, NUTS AND GASKET.
8. COMPLETE WITH COVER HANDLES, INTERNAL PLUG, BOLTS, NUTS AND GASKET.
9. INTERNAL BAFFLE HAS BEEN DESIGNED FOR 6" WG DIFFERENTIAL PRESSURE.
10. FOR CONSTRUCTION TOLERANCES AND LIFTING LUG REQUIREMENTS SEE ADDENDA TO SCRUBBER SPEC. 100005-1
11. COMPLETE WITH BLIND FLANGE, BOLTS, NUTS AND GASKET. (NOTE: BLIND FLANGE TO BE SUPPLIED WITH 2" 3000LB FULL COUPLING AND 3000LB HEX HEAD PLUG.)
12. * * SHIM PACK THICKNESS SHOWN IS FOR DESIGN PURPOSES. THE ACTUAL SHIM PACK THICKNESS USED SHALL BE DETERMINED BY THE FIELD



CYCLONIC SECTION SUPPORT LUG DETAIL
(8) REQUIRED EQ. SPACED
¾" = 1'-0"



INLET BODY SECTION SUPPORT LUG DETAIL
(4) REQUIRED EQ SPACED
¾" = 1'-0"



ANGLE STIFF. FAB. DET. (IF REQ'D)
1" = 1'-0"

DESIGN DATA

SERVICE		PRESCRUBBER	
DESIGN AND CONSTRUCTION CODE		API-650 LATEST EDITION	
APPLICABLE CODE APPENDICES		"J" AND "S"	
DESIGN PRESSURE	INTERNAL: ATMOS + DESIGN LIQ.	DESIGN TEMP	MINIMUM: 20°F
	EXTERNAL: -40" WG		MAXIMUM: 225°F
OPERATING PRESSURE	INTERNAL: ATM	OPERATING TEMP	NORMAL: 181°F
	EXTERNAL: -5.5 TO -9.5" W.C		MINIMUM: -----
			MAXIMUM: -----
LIQUID LEVELS	MINIMUM: EMPTY	PUMPING RATES	IN: -----
	OPERATING: SEE DWG		OUT: -----
	MAXIMUM: SEE DWG		-----
CONTENTS	AMMONIA DUST & PHOS. ACID NEUTRALIZED TO AN N:P MR OF 1.2-1.45		
CONTENTS SPECIFIC GRAVITY	1.35		
WIND DESIGN	PER ASCE 7, BASIC WIND SPEED OF 130 MPH EXPOSURE "C"		
SEISMIC DESIGN	0.2s SPECTRAL RESPONSE ACC. 17%g=Ss.		
	1.0s SPECTRAL RESPONSE ACC. = 4%g=S1		
CORROSION ALLOWANCE	SHELL: -----	TOP HEAD: -----	
	BOTTOM HEAD: -----	STRUCTURALS: -----	
	FIXED INTERNALS: -----	REMOVABLE INTERNALS: -----	
	ANCHOR BOLTS: -----		
CAPACITIES	OPERATING (DES. LIQ. LVL.)	INLET BODY SECT. (INCL. ½ OF CROSSOVER)	8,800 GALS.
		CYCLONIC SECT. (INCL. ½ OF CROSSOVER)	21,200 GALS.
WEIGHTS	FABRICATED	INLET BODY SECTION	29 000 LBS
		CYCLONIC SECTION	53 800 LBS
	EMPTY	INLET BODY SECTION	35 500 LBS.
		CYCLONIC SECTION	59 500 LBS.
	OPERATING (DES. LIQ. LVL.)	INLET BODY SECTION	137,500 LBS
		CYCLONIC SECTION	298,000 LBS.
	TOTAL MAXIMUM OPERATING		435 500 LBS.
FORCES	MAX. OVERTURNING MOMENT AT SUPPORTS (WIND)		LATER FT LBS
	MAX. SHEAR AT SUPPORTS (WIND)		LATER FT LBS

INSPECTION AND TESTING

INSPECTION BY	CLIENT AND/OR CLIENT'S REPRESENTATIVE		
WELD EXAM	RADIOGRAPHY SPOT PER API-650	LEAK TESTING	TOP HD: AIR / SOAP SUDS
	SUPPL. ULTRASONIC -----		SHELL: AIR / SOAP SUDS
			BOTT HD: AIR / SOAP SUDS
MILL TEST REPORTS REQUIRED	YES		

CONSTRUCTION DETAILS

TOP HEAD TYPE		ASME F&D
TOP HEAD SLOPE		-----
BOTTOM HEAD TYPE		CONICAL AND ASME F & D
PLATE SEAMS	TOP HEAD	BUTT WELD
	BOTT HD	BUTT WELD

MISCELLANEOUS

PAINTING		CARBON STEEL PARTS ONLY PER SPECIFICATION
EXTENT OF PAINTING	INTERNAL	NOT REQUIRED
	EXTERNAL	REQUIRED
LINING		NONE
INSULATION		NOT REQUIRED

REFERENCE STANDARDS AND SPECIFICATIONS

SCRUBBERS	PER JACOBS SPECIFICATION NO. 100005-1
PAINTING	PER CARGILL SPEC. TMG-6501-2007 IN PHOS. ACID PLANT SERVICE
VESSEL CONSTR. TOLERANCES	ADDENDUM 1 TO SPEC. NO. 100005-1
VESSEL LIFTING LUGS	ADDENDUM 2 TO SPEC. NO. 100005-1

MATERIALS

SHELL		A-240 GR 316L
BOTTOM HEAD		A-240 GR 316L
TOP HEAD		A-240 GR 316L
FORGINGS		A-182 F316L
SUPPORTS		A-240 GR 316L
NOZZLES	FLANGES (PLATE) A-240 GR 316L	(FORGING) A-182 F316L
	NECKS (PLATE) A-240 GR 316L	(PIPE) A-312 TP316L
	REINF	A-240 GR 316L
MANHOLES AND/OR HANDHOLES	FLANGES	A-240 GR 316L
	NECKS	A-240 GR 316L
	COVERS	A-240 GR 316L
	REINF	A-240 GR 316L
GASKETS	NOZZLES	1/8" THK NEOPRENE RING (70 DUROMETER)
	MANHOLES	1/8" THK NEOPRENE FULL FACE (70 DUROMETER)

INTERNAL BOLTING	BOLTS	-----
	NUTS	-----
EXTERNAL BOLTING	STUDS/BOLTS	A-193 GR B7 CADMIUM PLATED
	NUTS	A-194 GR 2H CADMIUM PLATED
INTERNALS	PIPE	A-312 TP316L
	PLATE	A-240 GR 316L
	STRUCTURALS	A-240 GR 316L
EXTERNALS	PLATE	A-240 GR 316L
	STRUCTURALS	A-240 GR 316L
SPRAY NOZZLES		316L ST. STL
SHIM PACK PLATES		A-36

REFERENCE DRAWINGS	
37-M0023	PRESCRUBBER-DETAILS

NO	DATE	REVISION	BY	CK	APP
2	11-14-03	LOCATED NOZZLES	MB		RAH
1	03-26-03	REVISED AS NOTED	DGB	EC	BH
0	03-11-03	ISSUE FOR CONSTRUCTION	DGB	EC	BH
P1	04-28-03	FOR QUOTATION & REVIEW	DGB	EC	BH

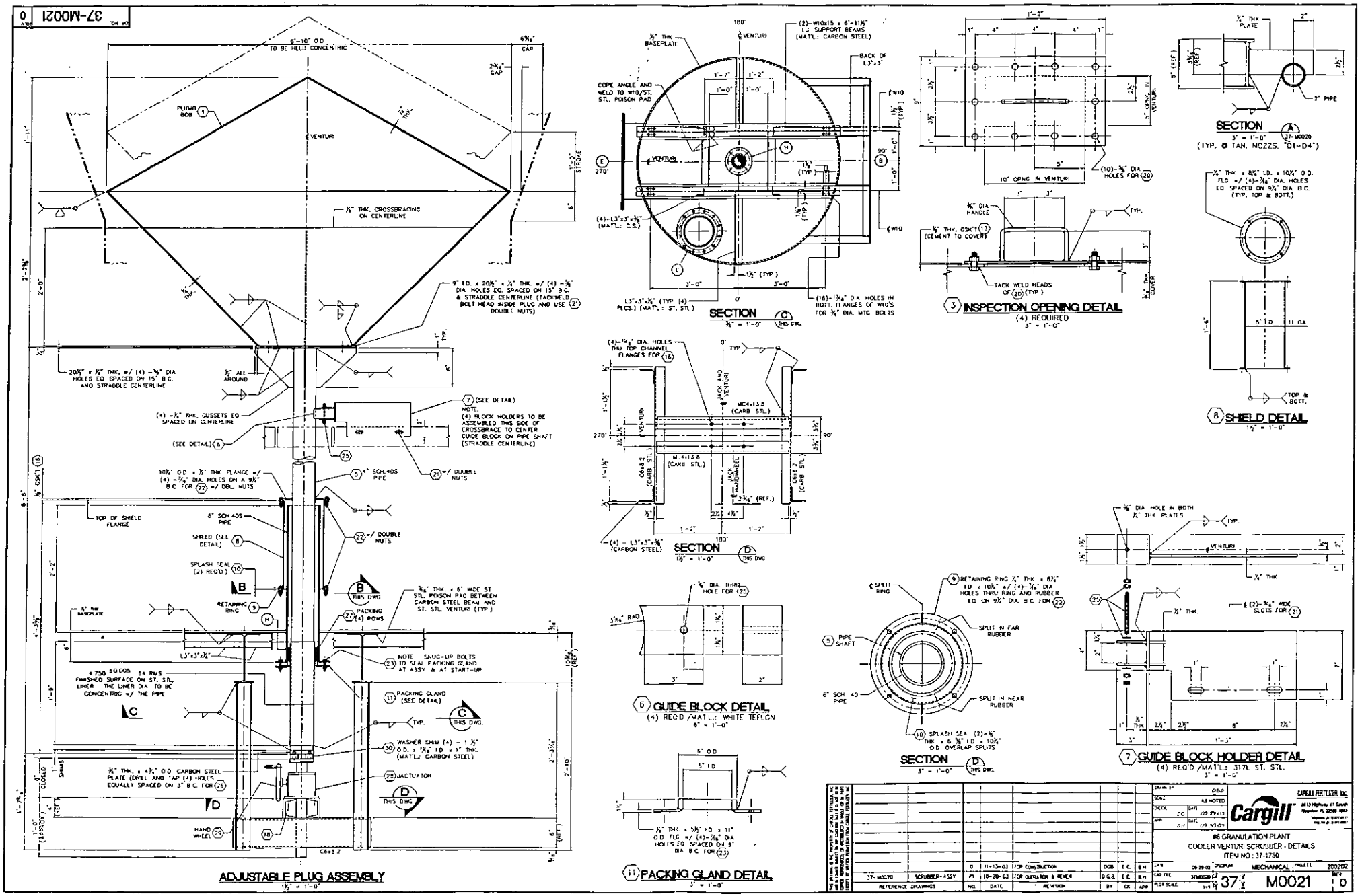
CARGILL FERTILIZER, Inc.

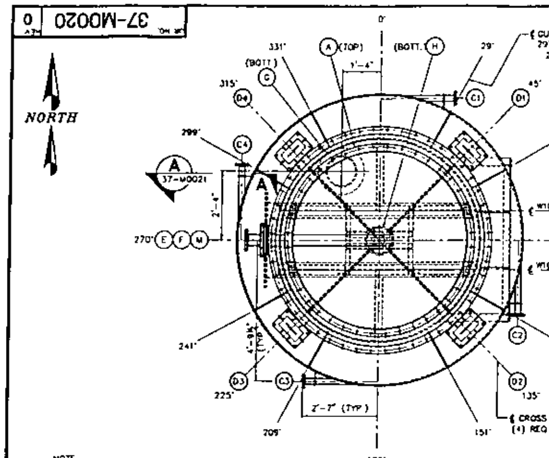
Cargill

#6 GRANULATION PLANT
PRESCRUBBER - ASSEMBLY
ITEM NO. 37-1720

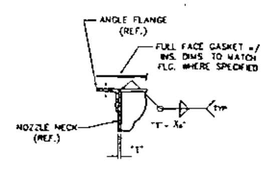
DRAWN BY: DGB | SCALE: 1/4" = 1'-0" | DATE: 02-21-03 | MECHANICAL | PROJECT: 200202

37 | M0022 | REV 2

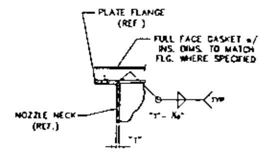

37-M0021
ADJUSTABLE PLUG ASSEMBLY
SECTION
INSPECTION OPENING DETAIL
(4) REQUIRED
SECTION
SHIELD DETAIL
GUIDE BLOCK DETAIL
(4) REQ'D /MAT'L: WHITE TEFLON
SECTION
GUIDE BLOCK HOLDER DETAIL
(4) REQ'D /MAT'L: 317L ST. STL.
PACKING GLAND DETAIL
#6 GRANULATION PLANT
COOLER VENTURI SCRUBBER - DETAILS
ITEM NO.: 37-1750
Cargill
MECHANICAL
37-M0021



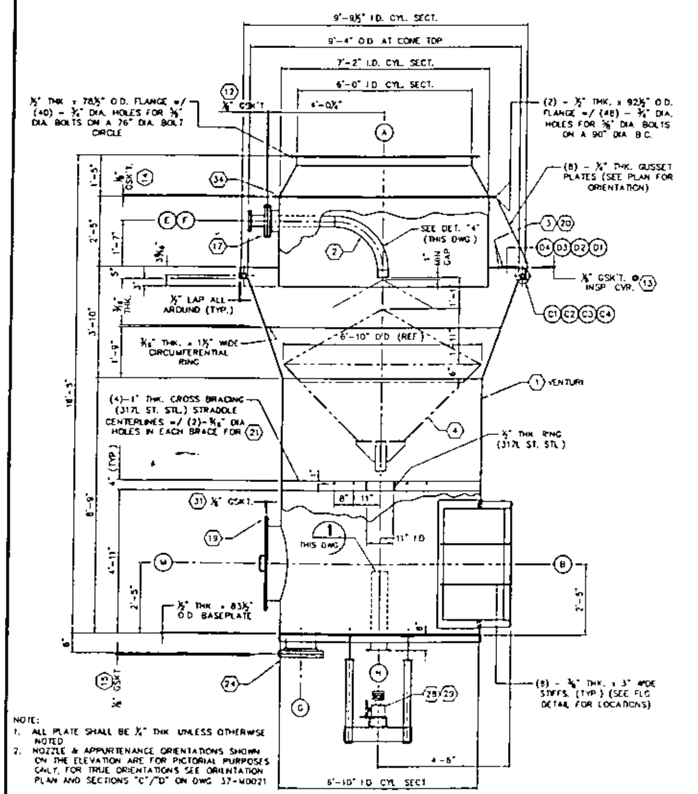
ORIENTATION PLAN



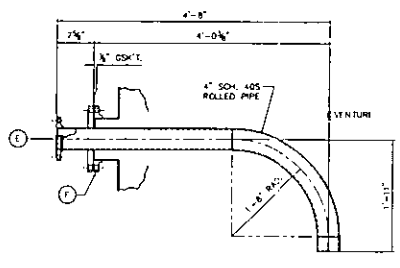
TYPICAL ANGLE FLANGE DETAIL
NONE



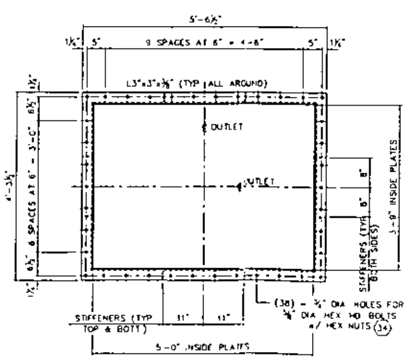
TYPICAL PLATE FLANGE DETAIL
NONE



ELEVATION 1



BULLET/MOUNT NOZZLE "E" / "F" DETAIL
1" = 1'-0"



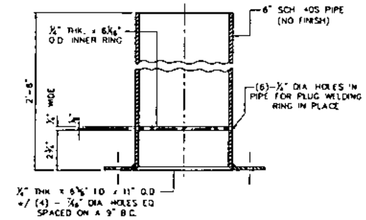
OUTLET NOZZLE "B" FLG. DET.
¾" = 1'-0"

NOZZLE SCHEDULE

CONN	QTY	SIZE	CLASS/ FLG. FACE	SERVICE	NECK THICK	PROJECTION	REMARKS
A	1	72" I.D.	PL. ½" THK.	VAPOR INLET	¼" THK	SEE DWG.	
B	1	45"x60"	L3"x3"x¼"	VAPOR OUTLET	¼" THK.	SEE DWG.	DET. THIS DWG
C1	1	2"	CL150/SO.RF	TAN. VENTURI LIQUID INLET	SCH. 40S	SEE DWG.	
C2	1	2"	CL150/SO.RF	TAN. VENTURI LIQUID INLET	SCH. 40S	SEE DWG.	
C3	1	2"	CL150/SO.RF	TAN. VENTURI LIQUID INLET	SCH. 40S	SEE DWG.	
C4	1	2"	CL150/SO.RF	TAN. VENTURI LIQUID INLET	SCH. 40S	SEE DWG.	
D1	1	5"x10"	-----	VENTURI INSPECTION	-----	-----	DET. DWG. M0021
D2	1	5"x10"	-----	VENTURI INSPECTION	-----	-----	DET. DWG. M0021
D3	1	5"x10"	-----	VENTURI INSPECTION	-----	-----	DET. DWG. M0021
D4	1	5"x10"	-----	VENTURI INSPECTION	-----	-----	DET. DWG. M0021
E	1	4"	CL150/SO.RF	BULLET NOZZLE	SCH. 40S	SEE DWG	DET. DWG. M0021
F	1	8"	CL150/SO.RF	MOUNT FOR "E"	SCH. 10S	SEE DWG	
G	1	12"	CL150/SO.FF	DRAIN/CLEANOUT	SCH. 40S	SEE DWG.	SEE NOTE "5"
H	1	6"	PL. ¼" THK.	ADJ. PLUG SHAFT MOUNT	SCH. 40S	SEE DWG	DET. DWG. M0021
M	1	30"	API-650	MANWAY	PER CODE	PER CODE	SEE NOTE "6"

GENERAL NOTES:

1. NOZZLE BOLT HOLES SHALL STRADDLE NATURAL NORTH/SOUTH VESSEL CENTERLINES OR THEIR PARALLELS UNLESS OTHERWISE NOTED.
2. ALL NOZZLE PROJECTIONS ARE TO THE FACE OF THE STEEL FLANGE.
3. SHELL NOZZLE PROJECTIONS ARE MEASURED FROM CENTER OF VESSEL TO FLANGE FACE.
4. FABRICATOR SHALL FURNISH AND INSTALL ALL PARTS UNLESS OTHERWISE NOTED.
5. COMPLETE WITH BLIND FLANGE, BOLTS, NUTS AND GASKET.
6. COMPLETE WITH COVER, HANDLES, BOLTS, NUTS AND GASKET.
7. FOR CONSTRUCTION TOLERANCES AND LIFTING LUG REQUIREMENTS SEE ADDENDA TO SCRUBBER SPEC. 10000S-1.
8. CORROSION ALLOWANCE. STAINLESS STEEL - NONE / CARBON STEEL - 1/16" TOTAL
9. PRESSURE TEST FULLY ASSEMBLED UNIT. ANY WELD OR GASKET LEAKS TO BE REPAIRED PRIOR TO SHIPMENT
10. X-RAY 1% MIN., 5% MAX. OF ALL WELDS IN NO LESS THAN (3) SEPERATE LOCATIONS. ANY WELD FOUND TO BE OF POOR QUALITY SHALL BE COMPLETELY GROUND OUT, REWELDED AND (2) OTHER LOCATIONS X-RAYED
11. ALL WELDING SHALL BE GAS TIGHT, FULL PENETRATION AND SHALL BE SUBJECTED TO THE VENDOR'S STANDARD TESTING PROCEDURES FOR FULL STRENGTH, CRACKS, SLAGGING, ETC. THE LATEST WELDING PROCEDURES OF THE AMERICAN WELDING SOCIETY SHALL BE FOLLOWED IN THE FABRICATION PROCESS. MINIMUM WELD SIZE SHALL BE EQUAL TO THE THICKNESS OF THE THINNEST METALS JOINED
12. CARBON STEEL ONLY: EXTERIOR SURFACE PREP. TO BE IN ACCORDANCE WITH SSPC-SP-6
13. CARBON STEEL ONLY. EXTERIOR FINISH TO BE IN ACCORDANCE WITH SPEC. TMC-0501-0007, PAINT SYS. 1, COLOR 9182



DETAIL 1 (THIS DWG.)
3" = 1'-0"

BILL OF MATERIAL

PART NO	QTY	DESCRIPTION	
32	48	⅝" DIA. x 2" LG HEX HD BOLTS w/ HEX NUTS (FOR COVER FLG)	
31	1	⅛" GASKET, FOR MANWAY "M" 30" ID x 35⅝" OD	
30	4	WASHER SHIM	DET DWG 37-M0021
29	1	DISHED TYPE HAND WHEEL (SOLID WEB) w/ ¾" DIA BORE, 2¾" SET SCREW AT 90° APART AND 3/16" x 3/32" KEYWAY REID TOOL SUPPLY COMPANY #YND9	
28	1	DUFF-NORTON MACHINE SCREW JACTUATOR MODEL KM-9005-1281 w/ KEYED LIFTING SCREW BELLOWS BOOT, TOP & BOTT MECHANICAL STOPS AND A 24:1 GEAR RATIO	
27	2FT	⅜" SQ PACKING, JOHN CRANE STYLE 2871	
26	4	⅝" DIA. x 2¼" LG. HEX. HD. CAP SCREWS	
25	4	⅝" DIA. x 4½" LG. STUDS w/ (4) HEX. NUTS & (2) WASHERS EA.	
24	12	¾" DIA. x 4" LG HEX HD BOLTS w/ HEX. NUTS	
23	4	⅝" DIA. x 2½" LG. HEX. HD. BOLTS w/ HEX NUTS	
22	8	⅝" DIA. x 1½" LG. HEX. HD. BOLTS w/ DBL. HEX NUTS	
21	12	⅝" DIA. x 2½" LG HEX HD BOLTS w/ WASHERS & DBL. HEX NUTS	
20	40	⅝" DIA. x 1½" LG HEX HD BOLTS w/ HEX. NUTS (FOR NOZZS "D1-4")	
19	42	⅝" DIA. x 2½" LG HEX HD BOLTS w/ HEX NUTS (FOR M.W. "M")	
18	4	⅝" DIA. x 3" LG. HEX. HD. BOLTS w/ HEX. NUTS & BEVEL WASHERS	
17	8	¾" DIA. x 3½" LG. HEX HD BOLTS w/ HEX. NUTS (FOR NOZZ. "F")	
16	1	⅛" RING GASKET 6⅝" I.D. x 10⅝" O.D.	DET DWG. M0021
15	1	⅛" RING GASKET FOR 4" 150LB R.F. NOZZLE "C"	
14	1	⅛" GASKET FOR COVER FLANGE	
13	4	⅛" GASKETS FOR INSP. OPNGS "D1-4"	SEE ITEM "3"
12	1	⅛" RING GASKET FOR 8" 150LB R.F. NOZZLE "F"	
11	1	PACKING GLAND	DET. DWG M0021
10	2	SPLASH SHIELD	DET DWG M0021
9	1	RETAINING RING	DET. DWG M0021
8	1	SHIELD	DET DWG M0021
7	4	GUIDE BLOCK HOLDER	DET DWG M0021
6	4	GUIDE BLOCK	DET DWG M0021
5	1	PIPE SHAFT	DET DWG M0021
4	1	PLUMP BOB	DET DWG M0021
3	4	INSPECTION OPENING COVER	DET DWG M0021
2	1	BULLET NOZZLE	DET THIS DWG
1	1	VENTURI	DET THIS DWG

DESIGN DATA

SERVICE		COOLER VENTURI SCRUBBER			
DESIGN AND CONSTRUCTION CODE		NONE (SEE NOTE "11")			
APPLICABLE CODE APPENDICES		-----			
DESIGN PRESSURE	INTERNAL	ATMOS. + DESIGN LIQ.	DESIGN TEMP	MINIMUM	30°F
	EXTERNAL	-40" W.C.		MAXIMUM	250°F
OPERATING PRESSURE	INTERNAL	ATM	OPERATING TEMP	NORMAL	108-139°F
	EXTERNAL	-22" W.C.		MINIMUM	-----
				MAXIMUM	-----
LIQUID LEVELS	MINIMUM	EMPTY	PUMPING RATES	IN	-----
	OPERATING	EMPTY		OUT	-----
	MAXIMUM	0'-9"			-----
CONTENTS	AIR CONTAINING NH3, FERTILIZER DUST (DAP) AND FLUORINE COMPOUNDS				
CONTENTS SPECIFIC GRAVITY		1.01			
WIND DESIGN	PER ASCE 7, BASIC WIND SPEED OF 130 MPH, EXPOSURE "C"				
SEISMIC DESIGN	0.2s SPECTRAL RESPONSE ACC. 17%g=Ss,				
	1.0s SPECTRAL RESPONSE ACC. = 4%g=S1				
CORROSION ALLOWANCE	SHELL	NONE	TOP HEAD		NONE
	BOTTOM HEAD	NONE	STRUCTURALS		SEE NOTE "8"
	FIXED INTERNALS	NONE	REMOVABLE INTERNALS		NONE
	ANCHOR BOLTS	NONE			
CAPACITIES	OPERATING				NONE
WEIGHTS	FABRICATED				10,000 LBS.
	EMPTY				20,000 LBS.
	OPERATING	(MAX)			25,600 LBS.
FORCES	MAX. OVERTURNING MOMENT AT SUPPORTS (WIND)				LATER FT. LBS.
	MAX. SHEAR AT SUPPORTS (WIND)				LATER FT. LBS.

INSPECTION AND TESTING

INSPECTION BY	CLIENT AND/OR CLIENT'S REPRESENTATIVE				
WELD EXAM	RADIOGRAPHY	SEE NOTE "10"	LEAK TESTING	TOP HD.	SEE NOTE "9"
	SUPPL. ULTRASONIC	-----		SHELL	SEE NOTE "9"
	DYE PENETRANT	ALL WELDS		BOTT HD	SEE NOTE "9"
MILL TEST REPORTS REQUIRED		YES			

CONSTRUCTION DETAILS

TOP HEAD TYPE		CONICAL
TOP HEAD SLOPE		PER DWG
BOTTOM HEAD TYPE		FLAT
PLATE SEAMS	TOP HEAD	BUTT WELD
	BOTT HD	BUTT WELD

MISCELLANEOUS

PAINTING		CARBON STEEL PARTS ONLY PER SPECIFICATION
EXTENT OF PAINTING	INTERNAL	NOT REQUIRED
	EXTERNAL	REQUIRED
LINING		NONE
INSULATION		NOT REQUIRED

REFERENCE STANDARDS AND SPECIFICATIONS

SCRUBBERS	PER JACOBS SPECIFICATION NO. 10000S-1
PAINTING	PER CARGILL SPEC. IMC-0501-0007 IN PHOS. ACID PLANT SERVICE
VESSEL CONSTR. TOLERANCES	ADDENDUM 1 TO SPEC. NO. 10000S-1
VESSEL LIFTING LUGS	ADDENDUM 2 TO SPEC. NO. 10000S-1

MATERIALS

SHELL		A-240 GR 316L		
BOTTOM HEAD		A-240 GR 316L		
TOP HEAD		A-240 GR 316L		
FORGINGS		A-182 F316L		
SUPPORTS		A-36 w/ A-240 GR 316L POISON PAD		
NOZZLES	FLANGES (PLATE)	A-240 GR 316L	(FORGING)	A-182 F316L
	NECKS (PLATE)	A-240 GR 316L	(PIPE)	A-312 TP316L
	REINF	A-240 GR 316L		
MANHOLES AND/OR HANDHOLES	FLANGES	A-240 GR 316L		
	NECKS	A-240 GR 316L		
	COVERS	A-240 GR 316L		
	REINF.	A-240 GR 316L		
GASKETS	NOZZLES	1/8" THK NEOPRENE (70 DUROMETER)		
	MANHOLES	1/8" THK NEOPRENE (70 DUROMETER)		

INTERNAL BOLTING	BOLTS	316L STAINLESS STEEL U.O.N.		
	NUTS	316L STAINLESS STEEL U.O.N.		
EXTERNAL BOLTING	STUDS/BOLTS	A-193 GR B7 CADMIUM PLATED		
	NUTS	A-194 GR 2H CADMIUM PLATED		
INTERNALS	PIPE	A-312 TP316L		
	PLATE	A-240 GR 316L U.O.N.		
	STRUCTURALS	A-240 GR 316L		
EXTERNALS	PLATE	A-240 GR 316L		
	STRUCTURALS	A-240 GR 316L		
GUIDE BLOCKS		WHITE TEFLON		
SPLASH SEAL		NEOPRENE RUBBER (45 TO 55 DUROMETER)		

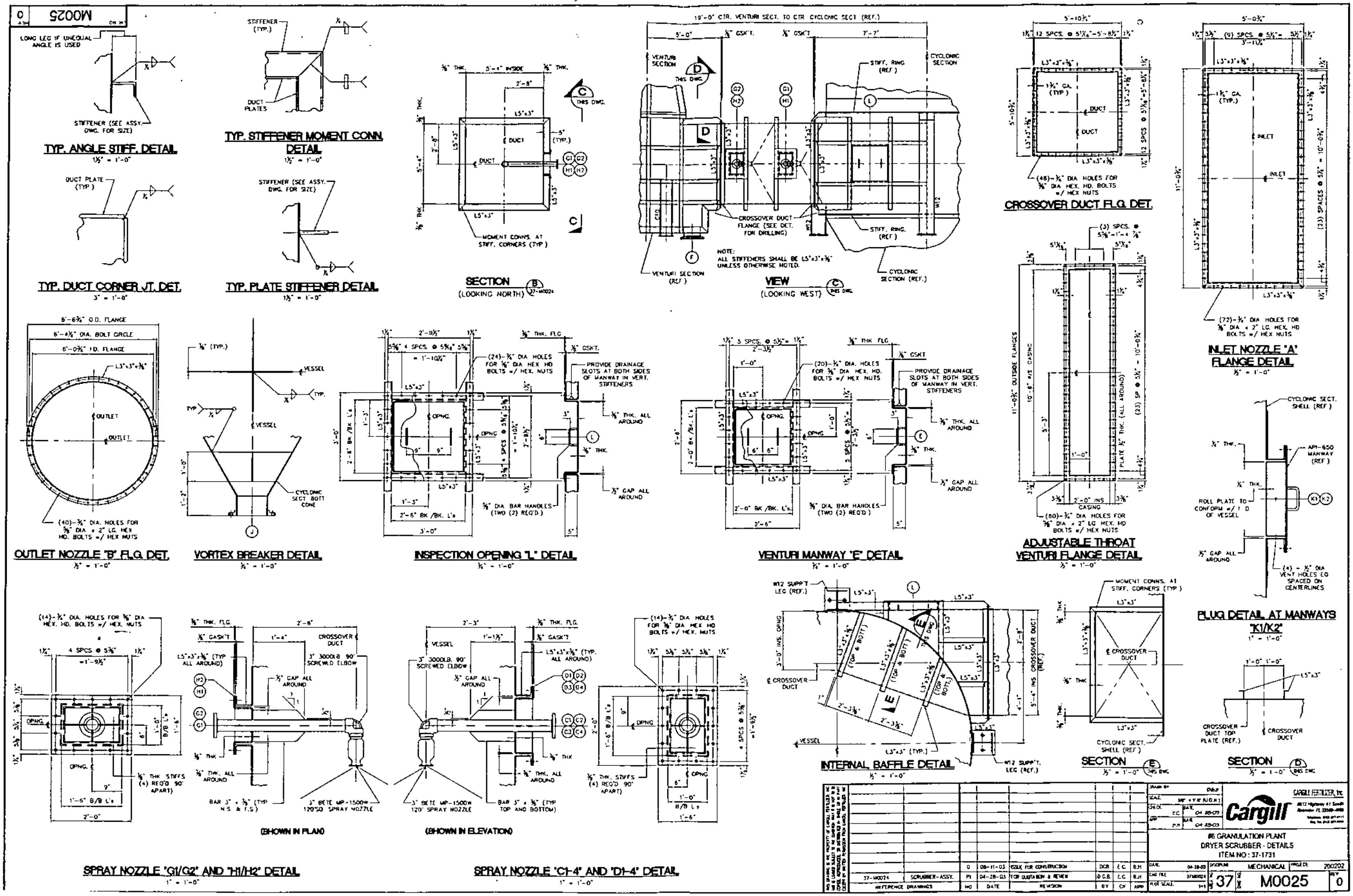
REFERENCE DRAWINGS		NO.	DATE	REVISION	BY	CK	APP
		0	11-13-03	FOR CONSTRUCTION	DCB	E.C.	B.M.
37-M0021	SCRUBBER - DETAILS	P1	10-20-03	FOR QUOTATION & REVIEW	D.C.B.	E.C.	B.M.

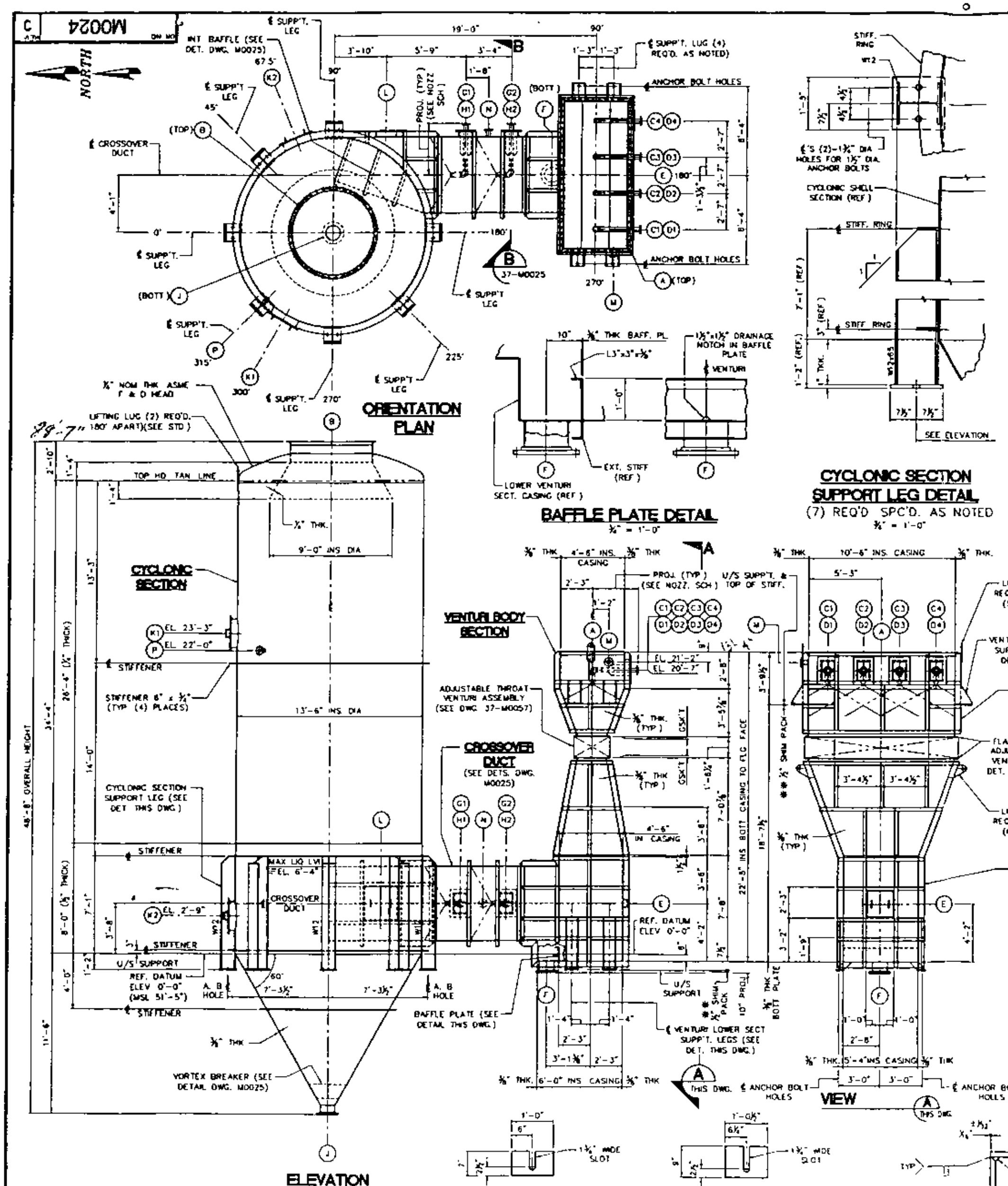
CARGILL FERTILIZER, Inc.

Cargill

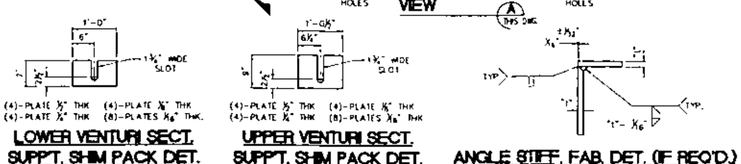
#6 GRANULATION PLANT
COOLER VENTURI SCRUBBER - ASSEMBLY
ITEM NO : 37-1750

DRAWN BY: DCB
DISCIPLINE: MECHANICAL
PROJECT: 200202
37 M0020 REV 0


M0025 0
TYP. ANGLE STIFF. DETAIL
1½" = 1'-0"
TYP. STIFFENER MOMENT CONN. DETAIL
1½" = 1'-0"
TYP. DUCT CORNER JT. DET.
3" = 1'-0"
TYP. PLATE STIFFENER DETAIL
1½" = 1'-0"
SECTION B
(LOOKING NORTH)
VIEW C
(LOOKING WEST)
CROSSOVER DUCT FLG. DET.
INLET NOZZLE "A" FLANGE DETAIL
OUTLET NOZZLE "B" FLG. DET.
VORTEX BREAKER DETAIL
INSPECTION OPENING "L" DETAIL
VENTURI MANWAY "E" DETAIL
ADJUSTABLE THROAT VENTURI FLANGE DETAIL
PLUG DETAIL AT MANWAYS "K1/K2"
1" = 1'-0"
INTERNAL BAFFLE DETAIL
SECTION E
SECTION D
SPRAY NOZZLE "G1/G2" AND "H1/H2" DETAIL
1" = 1'-0"
(SHOWN IN PLAN)
(SHOWN IN ELEVATION)
SPRAY NOZZLE "C1-4" AND "D1-4" DETAIL
1" = 1'-0"
NOTE:
ALL STIFFENERS SHALL BE L5"x3"x⅜" UNLESS OTHERWISE NOTED.
0 | 08-11-03 | ISSUE FOR CONSTRUCTION | DCB | EC | BJH
P1 | 04-28-03 | FOR QUOTATION & REVIEW | DCB | EC | BJH
37-M0024 | SCRUBBER-ASSY.
REFERENCE DRAWINGS
NO | DATE | REVISION | BY | CK | APP
Cargill
CARGILL FERTILIZER, Inc.
#6 GRANULATION PLANT
DRYER SCRUBBER - DETAILS
ITEM NO : 37-1731
MECHANICAL
200202
37
M0025
0



NOTES.
1. ALL FLAT PLATE STIFFENERS SHALL BE L5"x3"x⅜" UNLESS OTHERWISE NOTED
2. NOZZLE AND APPURTENANCE ORIENTATIONS SHOWN ON THE ELEVATION ARE FOR PICTORIAL PURPOSES ONLY. FOR TRUE ORIENTATIONS SEE ORIENTATION PLAN

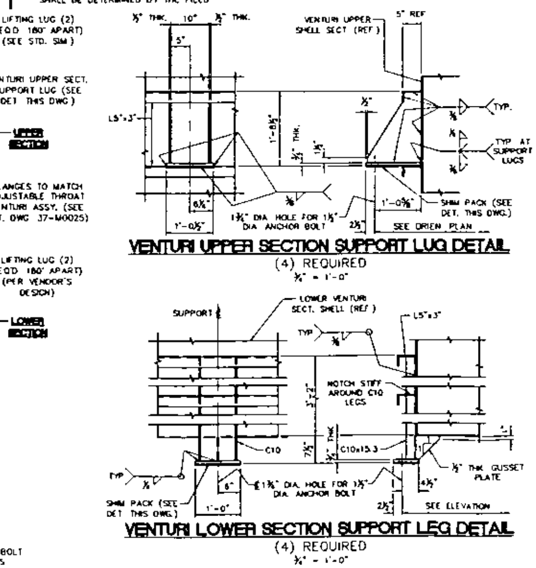


NOZZLE SCHEDULE

CONN	QTY	SIZE	CLASS/ FLG. FACE	SERVICE	NECK THICK	PROJECTION	REMARKS
A	1	54"x126"	L3"x3"x⅜"	VAPOR INLET	⅜" THK	SEE DWG.	DET. DWG. M0025
B	1	72"	L3"x3"x⅜"	VAPOR OUTLET	⅜" THK.	SEE DWG.	DET. DWG. M0025
C1	1	3"	CL150/SO,RF	SCRUBBER SPRAY	SCH 40S	3'-3"	DET. DWG. M0025
C2	1	3"	CL150/SO,RF	SCRUBBER SPRAY	SCH 40S	3'-3"	DET. DWG. M0025
C3	1	3"	CL150/SO,RF	SCRUBBER SPRAY	SCH. 40S	3'-3"	DET. DWG. M0025
C4	1	3"	CL150/SO,RF	SCRUBBER SPRAY	SCH 40S	3'-3"	DET. DWG. M0025
D1	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C1"	-----	SEE DET.	DET. DWG. M0025
D2	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C2"	-----	SEE DET.	DET. DWG. M0025
D3	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C3"	-----	SEE DET.	DET. DWG. M0025
D4	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C4"	-----	SEE DET.	DET. DWG. M0025
E	1	24"x24"	L5"x3"x⅜"	VENTURI MANWAY	-----	SEE DET.	NOTE "8" & DET. M0025
F	1	12"	CL150/SO,RF	VENTURI DRAIN	STD WT	SEE DWG.	
G1	1	3"	CL150/SO,FF	CROSSOVER DUCT SPRAY	SCH 40S	3'-8"	DET. DWG. M0025
G2	1	3"	CL150/SO,FF	CROSSOVER DUCT SPRAY	SCH 40S	3'-8"	DET. DWG. M0025
H1	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "G1"	-----	SEE DET.	DET. DWG. M0025
H2	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "G2"	-----	SEE DET.	DET. DWG. M0025
J	1	12"	CL150/SO,RF	CYCLONE SECT. DRAIN	STD WT	SEE DWG.	
K1	1	24"	PER API-650	CYCLONIC SECT. SHELL M. W.	PER CODE	PER CODE	NOTE "8" & DET. M0025
K2	1	24"	PER API-650	CYCLONIC SECT. SHELL M. W.	PER CODE	PER CODE	NOTE "8" & DET. M0025
L	1	30"x30"	L5"x3"x⅜"	CROSSOVER DUCT INSP OPNG.	-----	PER CODE	NOTE "8" & DET. M0025
M	1	3"	CL150/SO,FF	SAMPLE PORT	SCH 40S	5'-10"	NOTE "11"
N	1	3"	CL150/SO,FF	SAMPLE PORT	SCH 40S	3'-3"	NOTE "11"
P	1	3"	CL150/SO,FF	SAMPLE PORT	SCH 40S	7'-1"	NOTE "11"

GENERAL NOTES:

1. NOZZLE BOLT HOLES SHALL STRADDLE NATURAL NORTH/SOUTH VESSEL CENTERLINES OR THEIR PARALLELS UNLESS OTHERWISE NOTED
2. ALL NOZZLE PROJECTIONS ARE TO THE FACE OF THE STEEL FLANGE
3. SHELL NOZZLE PROJECTIONS ARE MEASURED FROM CENTER OF VESSEL OR CROSSOVER DUCT TO FLG. FACE.
4. HEAD NOZZLE PROJECTIONS ARE MEASURED FROM THE HEAD TANGENT LINE TO FLANGE FACE
5. FABRICATOR SHALL FURNISH AND INSTALL ALL PARTS UNLESS OTHERWISE NOTED.
6. * INDICATES VENDOR TO VERIFY OR SPECIFY
7. COMPLETE WITH BLIND FLANGE, BOLTS, NUTS AND GASKET.
8. COMPLETE WITH COVER, HANDLES, INTERNAL PLUG, BOLTS, NUTS AND GASKET.
9. INTERNAL BAFFLE HAS BEEN DESIGNED FOR 20 W.G. DIFFERENTIAL PRESSURE.
10. FOR CONSTRUCTION TOLERANCES AND LIFTING LUG REQUIREMENTS SEE ADDENDA TO SCRUBBER SPEC. 100005-1.
11. COMPLETE WITH BLIND FLANGE, BOLTS, NUTS AND GASKET. (NOTE. BLIND FLANGE TO BE SUPPLIED WITH 2" 3000LB COUPLING AND 3000LB. HEX HEAD PLUG.)
12. ** SHIM PACK THICKNESS SHOWN IS FOR DESIGN PURPOSES. THE ACTUAL SHIM PACK THICKNESS USED SHALL BE DETERMINED BY THE FIELD



DESIGN DATA

SERVICE		DRYER SCRUBBER		
DESIGN AND CONSTRUCTION CODE		API-650 LATEST EDITION		
APPLICABLE CODE APPENDICES		"F" AND "S"		
DESIGN PRESSURE	INTERNAL	ATMOS. + DESIGN LIQ.	DESIGN TEMP — MINIMUM	30°F
	EXTERNAL	-35" W.G.	MAXIMUM	250°F
OPERATING PRESSURE	INTERNAL	ATM	OPERATING TEMP. — NORMAL	182°F
	EXTERNAL	-19" W.G.	MINIMUM	-----
			MAXIMUM	-----
LIQUID LEVELS	MINIMUM	EMPTY	PUMPING RATES — IN	-----
	OPERATING	SEE DWG.	OUT	-----
	MAXIMUM	SEE DWG.		-----
CONTENTS		AIR CONTAINING NH3, FERTILIZER DUST (DAP) AND FLUORINE COMPOUNDS		
CONTENTS SPECIFIC GRAVITY		1.33		
WIND DESIGN		PER ASCE 7, BASIC WIND SPEED OF 130 MPH, EXPOSURE "C"		
SEISMIC DESIGN		0.2s SPECTRAL RESPONSE ACC. 17%g=Ss, 1.0s SPECTRAL RESPONSE ACC. = 4%g=S1		
CORROSION ALLOWANCE	SHELL	-----	TOP HEAD	-----
	BOTTOM HEAD	-----	STRUCTURALS	-----
	FIXED INTERNALS	-----	REMOVABLE INTERNALS	-----
	ANCHOR BOLTS	-----		
CAPACITIES	OPERATING (DES. LIQ. LVL.)	VENTURI SECT (INCL. ½ OF CROSSOVER)		2,600 GALS.
		CYCLONIC SECT (INCL. ½ OF CROSSOVER)		12,200 GALS.
WEIGHTS	FABRICATED	VENTURI SECT (UPPER) 7,100 LBS. (LOWER)		13,500 LBS.
		CYCLONIC SECTION		38,500 LBS.
	EMPTY	VENTURI SECT (UPPER) 12,500 LBS. (LOWER)		13,400 LBS.
		CYCLONIC SECTION		39,800 LBS.
	OPERATING (DES. LIQ. LVL.)	VENTURI SECT (UPPER) 13,500 LBS. (LOWER)		44,000 LBS.
		CYCLONIC SECT		178,500 LBS.
	TOTAL MAXIMUM OPERATING			236,000 LBS.
FORCES	MAX. OVERTURNING MOMENT AT SUPPORTS (WIND)			LATER FT. LBS.
	MAX. SHEAR AT SUPPORTS (WIND)			LATER FT. LBS.

INSPECTION AND TESTING

INSPECTION BY		CLIENT AND/OR CLIENT'S REPRESENTATIVE		
WELD EXAM	RADIOGRAPHY	SPOT PER API-650	LEAK TESTING — TOP HD	AIR / SOAP SUDS
	SUPPL. ULTRASONIC	-----	SHELL	AIR / SOAP SUDS
			BOTT HD	AIR / SOAP SUDS
MILL TEST REPORTS REQUIRED		YES		

CONSTRUCTION DETAILS

TOP HEAD TYPE		ASME F & D
TOP HEAD SLOPE		-----
BOTTOM HEAD TYPE		CONICAL
PLATE SEAMS	TOP HEAD	BUTT WELD
	BOTT HD	BUTT WELD

MISCELLANEOUS

PAINTING		CARBON STEEL PARTS ONLY PER SPECIFICATION
EXTENT OF PAINTING	INTERNAL	NOT REQUIRED
	EXTERNAL	REQUIRED
LINING		NONE
INSULATION		NOT REQUIRED

REFERENCE STANDARDS AND SPECIFICATIONS

SCRUBBERS	PER JACOBS SPECIFICATION NO. 100005-1
PAINTING	PER CARGILL SPEC. TMG-0501-0007 IN PHOS. ACID PLANT SERVICE
VESSEL CONSTR. TOLERANCES	ADDENDUM 1 TO SPEC. NO. 100005-1
VESSEL LIFTING LUGS	ADDENDUM 2 TO SPEC. NO. 100005-1

MATERIALS

SHELL		A-240 GR 316L
BOTTOM HEAD		A-240 GR 316L
TOP HEAD		A-240 GR 316L
FORGINGS		A-182 F316L
SUPPORTS		A-240 GR 316L
NOZZLES	FLANGES	(PLATE) A-240 GR 316L (FORGING) A-182 F316L
	NECKS	(PLATE) A-240 GR.316L (PIPE) A-312 TP316L
	REINF	A-240 GR 316L
MANHOLES AND/OR HANDHOLES	FLANGES	A-240 GR 316L
	NECKS	A-240 GR 316L
	COVERS	A-240 GR 316L
	REINF	A-240 GR 316L
GASKETS	NOZZLES	1/8" THK NEOPRENE RING (70 DUROMETER)
	MANHOLES	1/8" THK. NEOPRENE FULL FACE (70 DUROMETER)

INTERNAL BOLTING	BOLTS	-----
	NUTS	-----
EXTERNAL BOLTING	STUDS/BOLTS	A-193 GR B7 CADMIUM PLATED
	NUTS	A-194 GR 2H CADMIUM PLATED
INTERNALS	PIPE	A-312 TP316L
	PLATE	A-240 GR 316L
	STRUCTURALS	A-240 GR 316L
EXTERNALS	PLATE	A-240 GR 316L
	STRUCTURALS	A-240 GR 316L
SPRAY NOZZLES		316L ST. STL.
SHIM PACK PLATES		A-36

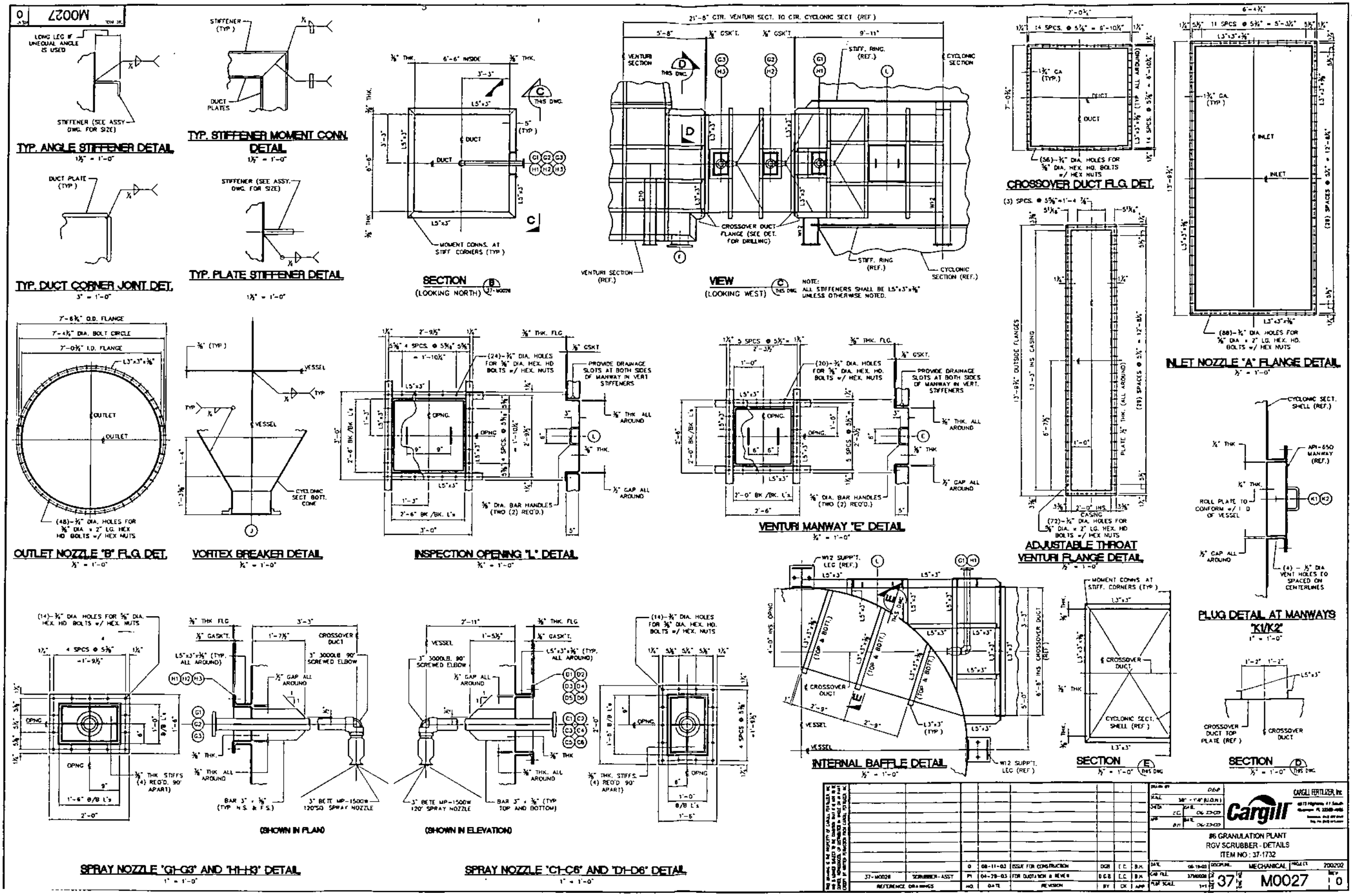
REFERENCE DRAWINGS		NO	DATE	REVISION	BY	CK	APP
37-M0057	ADJ. THROAT-DETS.	0	08-11-03	ISSUE FOR CONSTRUCTION	DGB	E.C.	B.H.
37-M0025	SCRUBBER-DETAILS	P1	4-28-03	FOR QUOTATION & REVIEW	DGB	E.C.	B.H.

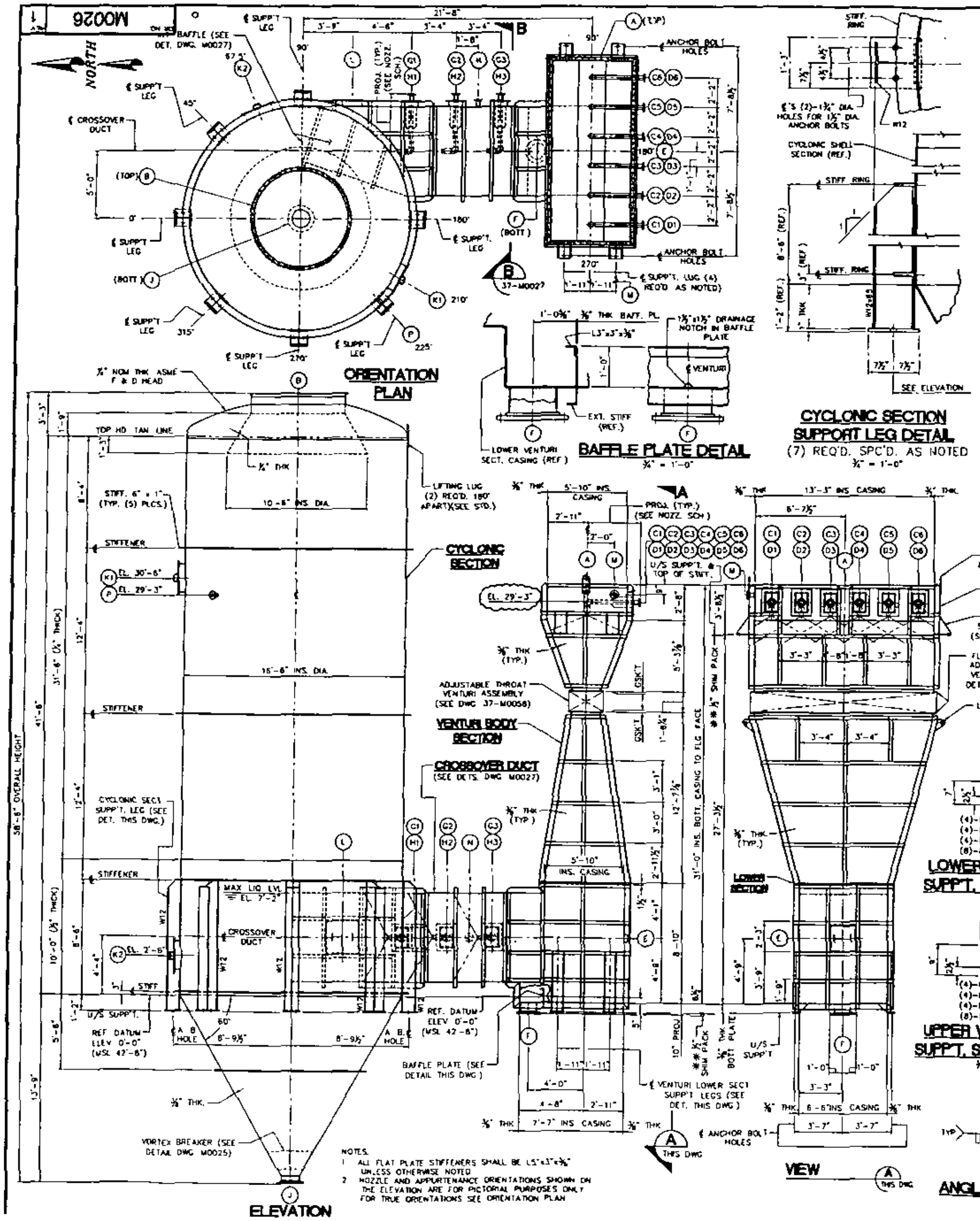
CARGILL FERTILIZER, Inc.

Cargill

#6 GRANULATION PLANT
DRYER SCRUBBER - ASSEMBLY
ITEM NO. 37-1731

DISCIPLINE: MECHANICAL — PROJECT: 200202
37 — M0024 — REV 0


M0027
TYP. ANGLE STIFFENER DETAIL
1½" = 1'-0"
TYP. STIFFENER MOMENT CONN. DETAIL
1½" = 1'-0"
TYP. DUCT CORNER JOINT DET.
3" = 1'-0"
TYP. PLATE STIFFENER DETAIL
1½" = 1'-0"
SECTION B
(LOOKING NORTH)
VIEW C
(LOOKING WEST)
NOTE: ALL STIFFENERS SHALL BE L5"x3"x⅜" UNLESS OTHERWISE NOTED.
21'-8" CTR. VENTURI SECT. TO CTR. CYCLONIC SECT. (REF.)
CROSSOVER DUCT FLG. DET.
INLET NOZZLE "A" FLANGE DETAIL
½" = 1'-0"
OUTLET NOZZLE "B" FLG. DET.
½" = 1'-0"
VORTEX BREAKER DETAIL
¾" = 1'-0"
INSPECTION OPENING "L" DETAIL
¾" = 1'-0"
VENTURI MANWAY "E" DETAIL
¾" = 1'-0"
ADJUSTABLE THROAT VENTURI FLANGE DETAIL
½" = 1'-0"
PLUG DETAIL AT MANWAYS "K1/K2"
1" = 1'-0"
INTERNAL BAFFLE DETAIL
½" = 1'-0"
SECTION E
½" = 1'-0"
SECTION D
½" = 1'-0"
(SHOWN IN PLAN)
(SHOWN IN ELEVATION)
SPRAY NOZZLE "G1-G3" AND "H1-H3" DETAIL
1" = 1'-0"
SPRAY NOZZLE "C1-C6" AND "D1-D6" DETAIL
1" = 1'-0"
0 | 08-11-03 | ISSUE FOR CONSTRUCTION | DGB | E.C. | B.H.
P1 | 04-28-03 | FOR QUOTATION & REVIEW | DGB | E.C. | B.H.
37-M0026 SCRUBBER-ASSY
REFERENCE DRAWINGS
NO. | DATE | REVISION | BY | CK | APP
CARGILL FERTILIZER, Inc.
Cargill
#6 GRANULATION PLANT
RGV SCRUBBER - DETAILS
ITEM NO: 37-1732
MECHANICAL
200202
37
M0027
0



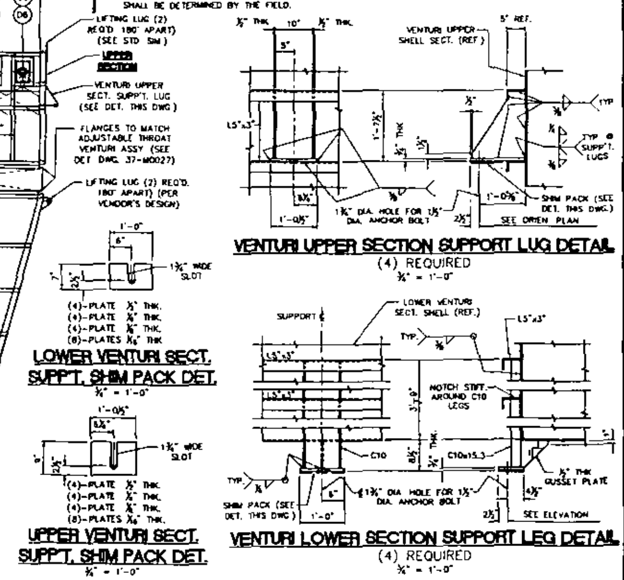
NOTES:
1. ALL FLAT PLATE STIFFENERS SHALL BE L5"x3"x⅜" UNLESS OTHERWISE NOTED
2. NOZZLE AND APPURTENANCE ORIENTATIONS SHOWN ON THE ELEVATION ARE FOR PICTORIAL PURPOSES ONLY. FOR TRUE ORIENTATIONS SEE ORIENTATION PLAN

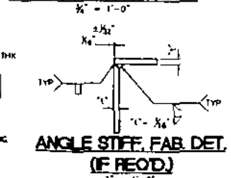
NOZZLE SCHEDULE

CONN	QTY	SIZE	CLASS/ FLG FACE	SERVICE	NECK THICK	PROJECTION	REMARKS
A	1	70"x159"	L3"x3"x⅜"	VAPOR INLET	⅜" THK.	SEE DWG.	DET. DWG. M0027
B	1	84"	L3"x3"x⅜"	VAPOR OUTLET	⅜" THK.	SEE DWG.	DET. DWG. M0027
C1	1	3"	CL150/SO,RF	SCRUBBER SPRAY	SCH. 40S	3'-11"	DET. DWG. M0027
C2	1	3"	CL150/SO,RF	SCRUBBER SPRAY	SCH. 40S	3'-11"	DET. DWG. M0027
C3	1	3"	CL150/SO,RF	SCRUBBER SPRAY	SCH. 40S	3'-11"	DET. DWG. M0027
C4	1	3"	CL150/SO,RF	SCRUBBER SPRAY	SCH. 40S	3'-11"	DET. DWG. M0027
C5	1	3"	CL150/SO,RF	SCRUBBER SPRAY	SCH. 40S	3'-11"	DET. DWG. M0027
C6	1	3"	CL150/SO,RF	SCRUBBER SPRAY	SCH. 40S	3'-11"	DET. DWG. M0027
D1	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C1"	------	SEE DET.	DET. DWG. M0027
D2	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C2"	------	SEE DET.	DET. DWG. M0027
D3	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C3"	------	SEE DET.	DET. DWG. M0027
D4	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C4"	------	SEE DET.	DET. DWG. M0027
D5	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C5"	------	SEE DET.	DET. DWG. M0027
D6	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "C6"	------	SEE DET.	DET. DWG. M0027
E	1	24"x24"	L5"x3"x⅜"	VENTURI MANWAY	------	SEE DET.	NOTE "8" & DET. M0027
F	1	14"	CL150/SO,RF	VENTURI DRAIN	STD. WT.	SEE DWG.	
G1	1	3"	CL150/SO,FF	CROSSOVER DUCT SPRAY	SCH. 40S	4'-3"	DET. DWG. M0027
G2	1	3"	CL150/SO,FF	CROSSOVER DUCT SPRAY	SCH. 40S	4'-3"	DET. DWG. M0027
G3	1	3"	CL150/SO,FF	CROSSOVER DUCT SPRAY	SCH. 40S	4'-3"	DET. DWG. M0027
H1	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "G1"	------	SEE DET.	DET. DWG. M0027
H2	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "G2"	------	SEE DET.	DET. DWG. M0027
H3	1	12"x18"	L5"x3"x⅜"	MOUNT FOR "G3"	------	SEE DET.	DET. DWG. M0027
J	1	18"	CL150/SO,RF	CYCLONE SECT. DRAIN	STD. WT.	SEE DWG.	
K1	1	24"	PER API-650	CYCLONIC SECT. SHELL M. W.	PER CODE	PER CODE	NOTE "8" & DET. M0027
K2	1	24"	PER API-650	CYCLONIC SECT. SHELL M. W.	PER CODE	PER CODE	NOTE "8" & DET. M0027
L	1	30"x30"	L5"x3"x⅜"	CROSSOVER DUCT INSP OPNG.	------	PER CODE	NOTE "8" & DET. M0027
M	1	3"	CL150/SO,FF	SAMPLE PORT	SCH. 40S	7'-3"	NOTE "11"
N	1	3"	CL150/SO,FF	SAMPLE PORT	SCH. 40S	3'-10"	NOTE "11"
P	1	3"	CL150/SO,FF	SAMPLE PORT	SCH. 40S	8'-10"	NOTE "11"

GENERAL NOTES:

1. NOZZLE BOLT HOLES SHALL STRADDLE NATURAL NORTH/SOUTH VESSEL CENTERLINES OR THEIR PARALLELS UNLESS OTHERWISE NOTED
2. ALL NOZZLE PROJECTIONS ARE TO THE FACE OF THE STEEL FLANGE.
3. SHELL NOZZLE PROJECTIONS ARE MEASURED FROM CENTER OF VESSEL OR CROSSOVER DUCT TO FLG. FACE.
4. HEAD NOZZLE PROJECTIONS ARE MEASURED FROM THE HEAD TANGENT LINE TO FLANGE FACE.
5. FABRICATOR SHALL FURNISH AND INSTALL ALL PARTS UNLESS OTHERWISE NOTED.
6. # INDICATES VENDOR TO VERIFY OR SPECIFY
7. COMPLETE WITH BLIND FLANGE, BOLTS, NUTS AND GASKET.
8. COMPLETE WITH COVER, HANDLES, INTERNAL PLUG, BOLTS, NUTS AND GASKET.
9. INTERNAL BAFFLE HAS BEEN DESIGNED FOR 20 W.G. DIFFERENTIAL PRESSURE.
10. FOR CONSTRUCTION TOLERANCES AND LIFTING LUG REQUIREMENTS SEE ADDENDA TO SCRUBBER SPEC. 100005-1.
11. COMPLETE WITH BLIND FLANGE, BOLTS, NUTS AND GASKET (NOTE: BLIND FLANGE TO BE SUPPLIED WITH 2" 3000LB COUPLING AND 3000LB HEX HEAD PLUG)
12. # # SHIM PACK THICKNESS SHOWN IS FOR DESIGN PURPOSES. THE ACTUAL SHIM PACK THICKNESS USED SHALL BE DETERMINED BY THE FIELD.





DESIGN DATA

SERVICE		RGV SCRUBBER			
DESIGN AND CONSTRUCTION CODE		API-650 LATEST EDITION			
APPLICABLE CODE APPENDICES		"J" AND "S"			
DESIGN PRESSURE	INTERNAL	ATMOS. + DESIGN LIQ.	DESIGN TEMP	MINIMUM	30°F
	EXTERNAL	-40" W.G.		MAXIMUM	220°F
OPERATING PRESSURE	INTERNAL	ATM	OPERATING TEMP.	NORMAL	190°F
	EXTERNAL	-22.5" W.G.		MINIMUM	-----
				MAXIMUM	-----
LIQUID LEVELS	MINIMUM	EMPTY	PUMPING RATES	IN	-----
	OPERATING	SEE DWG.		OUT	-----
	MAXIMUM	SEE DWG.			-----
CONTENTS	AIR CONTAINING NH3, FERTILIZER DUST (DAP) AND FLUORINE COMPOUNDS				
CONTENTS SPECIFIC GRAVITY		1.33			
WIND DESIGN	PER ASCE 7, BASIC WIND SPEED OF 130 MPH, EXPOSURE "C"				
SEISMIC DESIGN		0.2s SPECTRAL RESPONSE ACC. 17%g=Ss			
		1.0s SPECTRAL RESPONSE ACC. = 4%g=S1			
CORROSION ALLOWANCE	SHELL	-----	TOP HEAD		-----
	BOTTOM HEAD	-----	STRUCTURALS		-----
	FIXED INTERNALS	-----	REMOVABLE INTERNALS		-----
	ANCHOR BOLTS				
CAPACITIES	OPERATING (DES. LIQ. LVL.)	VENTURI SECT (INCL. ½ OF CROSSOVER)			4,300 GALS
		CYCLONIC SECT (INCL. ½ OF CROSSOVER)			21,400 GALS
WEIGHTS	FABRICATED	VENTURI SECT (UPPER) 10,500 LBS. (LOWER)			20,000 LBS
		CYCLONIC SECTION			62,500 LBS
	EMPTY	VENTURI SECT (UPPER) 17,200 LBS. (LOWER)			21,000 LBS
		CYCLONIC SECTION			67,000 LBS
	OPERATING (DES. LIQ. LVL.)	VENTURI SECT (UPPER) 18,000 LBS. (LOWER)			70,000 LBS
		CYCLONIC SECT			306,000 LBS
	TOTAL MAXIMUM OPERATING				394,000 LBS
FORCES	MAX. OVERTURNING MOMENT AT SUPPORTS (WIND)				LATER FT LBS
	MAX. SHEAR AT SUPPORTS (WIND)				LATER FT LBS

INSPECTION AND TESTING

INSPECTION BY	CLIENT AND/OR CLIENT'S REPRESENTATIVE			
WELD EXAM.	RADIOGRAPHY SPOT PER API-650		LEAK TESTING	TOP HD. AIR / SOAP SUDS
	SUPPL. ULTRASONIC	-----		SHELL AIR / SOAP SUDS
				BOTT. HD. AIR / SOAP SUDS
MILL TEST REPORTS REQUIRED	YES			

CONSTRUCTION DETAILS

TOP HEAD TYPE		ASME F & D
TOP HEAD SLOPE		-----
BOTTOM HEAD TYPE		CONICAL
PLATE SEAMS	TOP HEAD	BUTT WELD
	BOTT. HD.	BUTT WELD

MISCELLANEOUS

PAINTING		CARBON STEEL PARTS ONLY PER SPECIFICATION
EXTENT OF PAINTING	INTERNAL	NOT REQUIRED
	EXTERNAL	REQUIRED
LINING		NONE
INSULATION		NOT REQUIRED

REFERENCE STANDARDS AND SPECIFICATIONS

SCRUBBERS	PER JACOBS SPECIFICATION NO. 100005-1
PAINTING	PER CARGILL SPEC. IMC-0501-0007 IN PHOS. ACID PLANT SERVICE
VESSEL CONSTR. TOLERANCES	ADDENDUM 1 TO SPEC. NO. 100005-1
VESSEL LIFTING LUGS	ADDENDUM 2 TO SPEC. NO. 100005-1

MATERIALS

SHELL		A-240 GR.316L		
BOTTOM HEAD		A-240 GR.316L		
TOP HEAD		A-240 GR.316L		
FORGINGS		A-182 F316L		
SUPPORTS		A-240 GR.316L		
NOZZLES	FLANGES (PLATE)	A-240 GR.316L	(FORGING)	A-182 F316L
	NECKS (PLATE)	A-240 GR.316L	(PIPE)	A-312 TP316L
	REINF.	A-240 GR.316L		
MANHOLES AND/OR HANDHOLES	FLANGES	A-240 GR.316L		
	NECKS	A-240 GR.316L		
	COVERS	A-240 GR.316L		
	REINF.	A-240 GR.316L		
GASKETS	NOZZLES	1/8" THK NEOPRENE RING (70 DUROMETER)		
	MANHOLES	1/8" THK NEOPRENE FULL FACE (70 DUROMETER)		

INTERNAL BOLTING	BOLTS	-----		
	NUTS	-----		
EXTERNAL BOLTING	STUDS/BOLTS	A-193 GR B7 CADMIUM PLATED		
	NUTS	A-194 GR 2H CADMIUM PLATED		
INTERNALS	PIPE	A-312 TP316L		
	PLATE	A-240 GR.316L		
	STRUCTURALS	A-240 GR.316L		
EXTERNALS	PLATE	A-240 GR.316L		
	STRUCTURALS	A-240 GR.316L		
SPRAY NOZZLES		316L ST. STL.		
SHIM PACK PLATES		A-36		

REFERENCE DRAWINGS		NO	DATE	REVISION	BY	CK	APP
		1	12-09-03	REVISED AS NOTED	DGB	C.C.	B.H.
37-M0058	ADJ. THROAT-DETS.	0	08-11-03	ISSUE FOR CONSTRUCTION	DGB	C.C.	B.H.
37-M0027	SCRUBBER-DETAILS	P1	04-28-03	FOR QUOTATION & REVIEW	D.G.B.	C.C.	B.H.

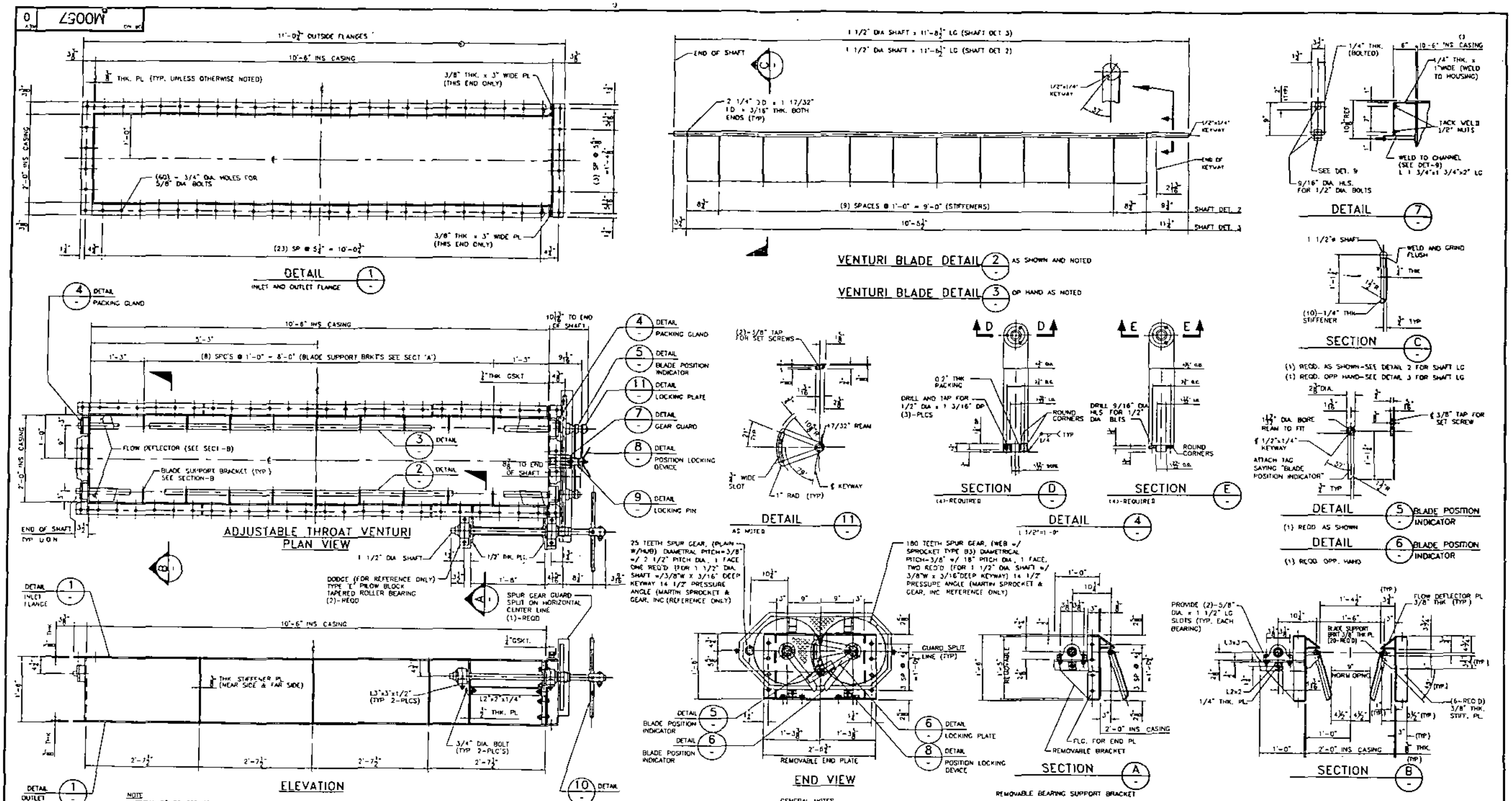
CARGILL FERTILIZER, Inc.

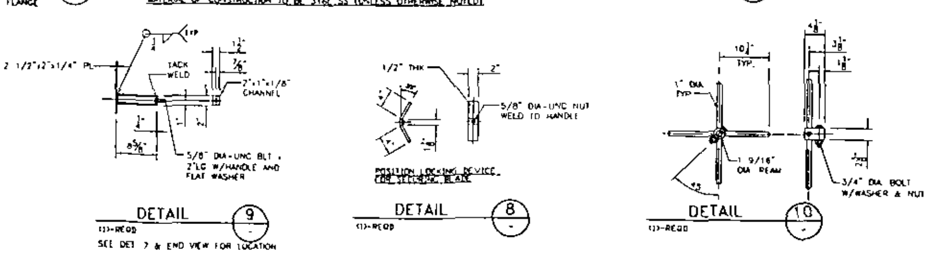
Cargill

DRAWN BY: DGB
SCALE: 1/4" = 1'-0"
CHECK: C.C. DATE: 06-19-03
APP: B.H. DATE: 06-19-03

#6 GRANULATION PLANT
RGV SCRUBBER - ASSEMBLY
ITEM NO.: 37-1732

DATE: 06-17-03 | DISCIPLINE: MECHANICAL | PROJECT: 200202
CAD FILE: 37M0026
PLOT SCALE: 1=1
37 | M0026 | REV 1





NOTE: MATERIAL OF CONSTRUCTION TO BE 316L SS (UNLESS OTHERWISE NOTED)

GENERAL NOTES

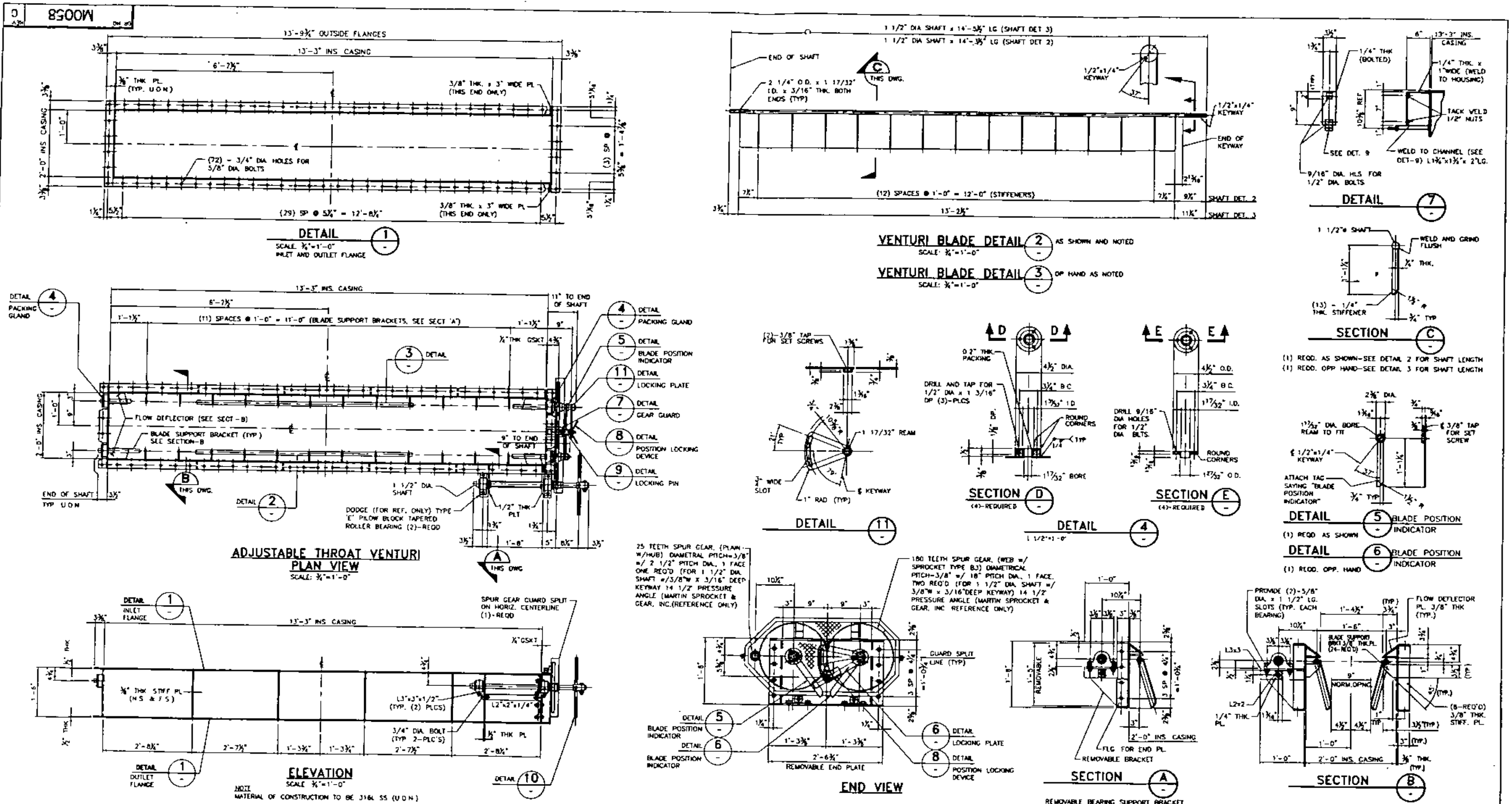
1. STAINLESS STEEL STRUCTURAL SHAPES PER ASTM A-276, LATEST EDITION. STAINLESS STEEL PLATES PER ASTM A-240 OR 316L
2. ALL HOLES TO BE PUNCHED, DRILLED OR MACHINED. BURNING OF HOLES IS UNACCEPTABLE.
3. FABRICATOR TO PROVIDE ALL BOLTS, NUTS, WASHERS & GASKETS.
4. FABRICATOR IS RESPONSIBLE FOR FIT-UP AND ASSEMBLY PRIOR TO SHIPPING.
5. FABRICATOR IS RESPONSIBLE FOR BLOCKING AND BRACING OF UNITS PRIOR TO SHIPMENT TO ASSURE THAT NO DISTORTION OCCURS DURING LOADING, SHIPPING, AND UNLOADING
6. SMALL ITEMS SHALL NOT BE SHIPPED LOOSE. THEY SHALL BE PLACED IN CRATES OR BOXES PROPERLY IDENTIFIED WITH ITEM TAG NUMBERS THEY ARE ASSOCIATED WITH.
7. FLANGE FACES SHALL BE PROTECTED WITH PLYWOOD COVERS MINIMUM 1/4" THICK FOR SHIPPING.
8. ALL DIMENSIONS ARE TO FACE OF FLANGE (STEEL) AND INSIDE WORK POINTS UNLESS OTHERWISE NOTED
9. BREAK ALL SHARP CORNERS. REMOVE BURRS AND GRIND SMOOTH
10. ALL WELDS ON PLATE WORK SHALL BE MADE AIRTIGHT BY CONTINUOUS WELD ON BOTH FACES
11. WELD UNDERCUTS AND EXCESSIVE WELD METAL BUILDUP AT FILLET WELDS SHALL BE REPAIRED
12. PRIOR TO TESTING AND FINAL INSPECTION WELDED JOINTS SHALL BE FREE OF SLAG, DIRT, OIL, PAINT, AND ALL OTHER FOREIGN MATTER
13. ALL WELDS MUST NOT HAVE ANY VISIBLE POROSITY, HOLES, HIGH SPOTS, BUMPS, POCKETS OR EXCESS SPATTER. WELD DEPOSITS LEFT AFTER REMOVAL OF TEMPORARY FABRICATION ATTACHMENTS SUCH AS DOGS AND CLIPS SHALL BE REMOVED BY GRINDING. BASE METAL DAMAGE RESULTING FROM THE REMOVAL OF SUCH ATTACHMENTS SHALL BE WELD REPAIRED AND GROUND
14. SEAMS – ALL SEAMS TO BE BUTT WELDED WITH CONTINUOUS FULL PENETRATION SOLID WELD FROM BOTH SIDES FOR ENTIRE LENGTH OF SEAM. THE BUTT WELD SEAM MISALIGNMENT TOLERANCE SHALL BE HELD TO A MAXIMUM OF 25% OF PLATE THICKNESS, AND IN NO CASE MAY IT EXCEED 1/8"

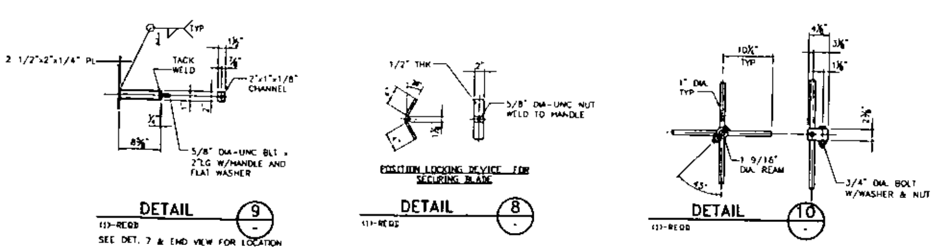
		0	06-11-03	ISSUE FOR CONSTRUCTION	DGB	CC	BH
DRYER SCRBR - ASSY	37M0024	P1	05-02-03	FOR QUOTATION & REVIEW	DGB	CC	BH
REFERENCE DRAWINGS		NO	DATE	REVISION	BY	CK	APP

CARGILL FERTILIZER, Inc.

#6 GRANULATION PLANT
DRYER SCRUBBER - ADJUSTABLE THROAT VENTURI DETAILS
ITEM NO : 37-1731

DRAWN BY	D Gray Burgess
SCALE	1" = 1'-0" U.O.N.
CHECKED	CC, DATE 04-30-03
APP	DA, DATE 05-02-03
DATE	04-30-03
DISCIPLINE	MECHANICAL
PROJECT	200202
CAD FILE	37M0057.dwg
PLOT SCALE	1=1
AREA	37
DWG NO	M0057
REV	0





GENERAL NOTES

1. STAINLESS STEEL STRUCTURAL SHAPES PER ASTM A-276, LATEST EDITION. STAINLESS STEEL PLATES PER ASTM A-240 GR 316L.
2. ALL HOLES TO BE PUNCHED, DRILLED OR MACHINED. BURNING OF HOLES IS UNACCEPTABLE.
3. FABRICATOR TO PROVIDE ALL BOLTS, NUTS, WASHERS & GASKETS.
4. FABRICATOR IS RESPONSIBLE FOR FIT-UP AND ASSEMBLY PRIOR TO SHIPPING.
5. FABRICATOR IS REPONSIBLE FOR BLOCKING AND BRACING OF UNITS PRIOR TO SHIPMENT TO ASSURE THAT NO DISTORTION OCCURS DURING LOADING, SHIPPING, AND UNLOADING.
6. SMALL ITEMS SHALL NOT BE SHIPPED LOOSE. THEY SHALL BE PLACED IN CRATES OR BOXES PROPERLY IDENTIFIED WITH ITEM TAG NUMBERS THEY ARE ASSOCIATED WITH.
7. FLANGE FACES SHALL BE PROTECTED WITH PLYWOOD COVERS MINIMUM 1/4" THICK FOR SHIPPING.
8. ALL DIMENSIONS ARE TO FACE OF FLANGE (STEEL) AND INSIDE WORK POINTS UNLESS OTHERWISE NOTED.
9. BREAK ALL SHARP CORNERS, REMOVE BURRS AND GRIND SMOOTH.
10. ALL WELDS ON PLATE WORK SHALL BE MADE AIRTIGHT BY CONTINUOUS WELD ON BOTH FACES.
11. WELD UNDERCUTS AND EXCESSIVE WELD METAL BUILDUP AT FILLET WELDS SHALL BE REPAIRED.
12. PRIOR TO TESTING AND FINAL INSPECTION WELDED JOINTS SHALL BE FREE OF SLAG, DIRT, OIL, PAINT, AND ALL OTHER FOREIGN MATTER.
13. ALL WELDS MUST NOT HAVE ANY VISIBLE POROSITY, HOLES, HIGH SPOTS, BUMPS, POCKETS OR EXCESS SPATTER. WELD DEPOSITS LEFT AFTER REMOVAL OF TEMPORARY FABRICATION ATTACHMENTS SUCH AS DOGS AND CLIPS SHALL BE REMOVED BY GRINDING. BASE METAL DAMAGE RESULTING FROM THE REMOVAL OF SUCH ATTACHMENTS SHALL BE WELD REPAIRED AND GROUND.
14. SEAMS - ALL SEAMS TO BE BUTT WELDED WITH CONTINUOUS FULL PENETRATION SOLID WELD FROM BOTH SIDES FOR ENTIRE LENGTH OF SEAM. THE BUTT WELD SEAM MISALIGNMENT TOLERANCE SHALL BE HELD TO A MAXIMUM OF 25% OF PLATE THICKNESS, AND IN NO CASE MAY IT EXCEED 1/8"

RGV SCRBR - ASSY	37M0026	0	08-11-03	ISSUE FOR CONSTRUCTION	DGB	E.C.	B.H.
		P1	04-28-03	FOR QUOTATION & REVIEW	DGB	EC	BH
REFERENCE DRAWINGS		NO	DATE	REVISION	BY	CK	APP

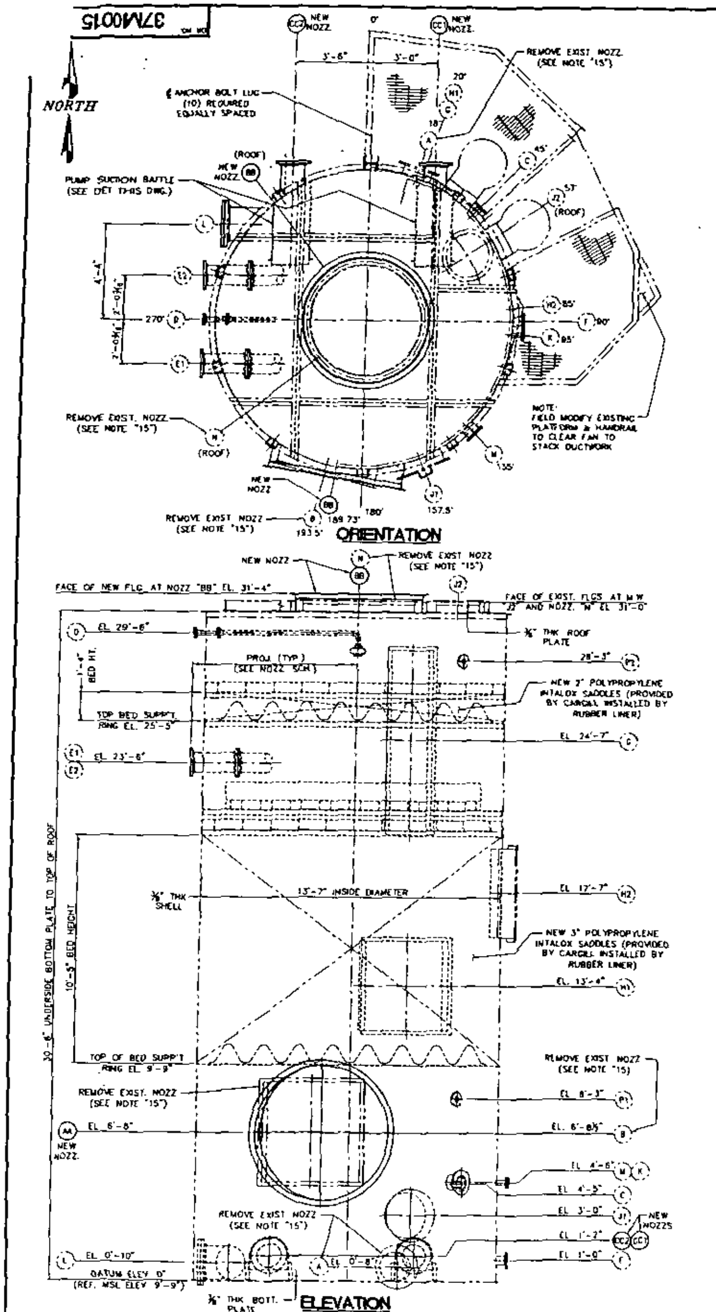
CARGILL FERTILIZER, Inc.

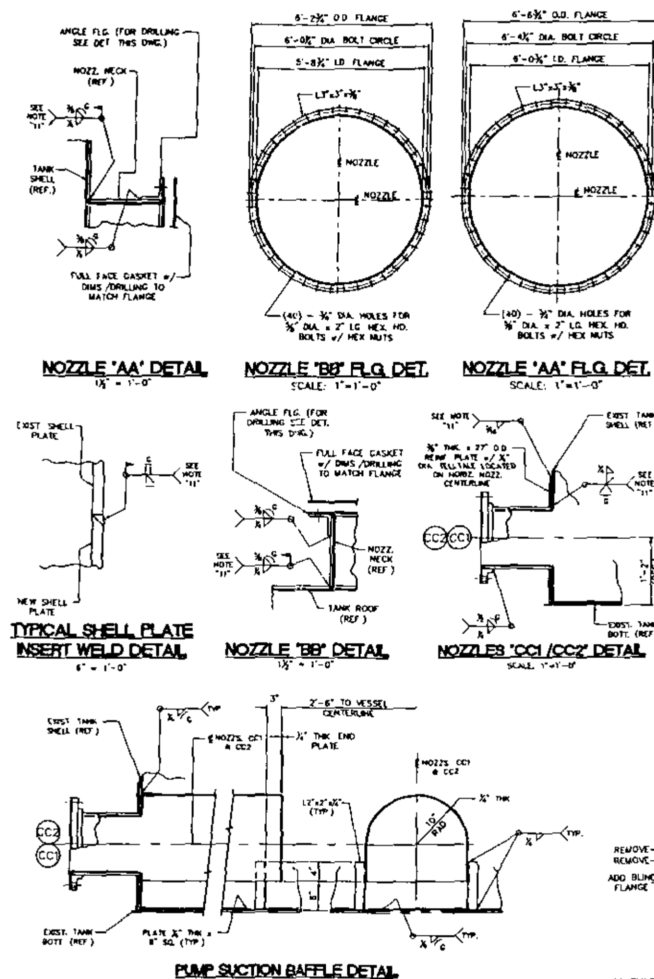
Cargill

DRAWN BY: D. Greg Burgess
SCALE: 1" = 1'-0" U.O.N.
CHECK: E.C. DATE: 06-23-03
APP: B.H. DATE: 06-23-03

#6 GRANULATION PLANT
RGV SCRUBBER - ADJUSTABLE THROAT VENTURI DETAILS
ITEM NO. 37-1732

DATE: 08-10-03 | DISCIPLINE: MECHANICAL | PROJECT: 200202
CAD FILE: 37M0058.dwg | AREA NO. 37 | DWG NO. M0058 | REV 0
PLOT SCALE: 1 = 1





DESIGN DATA:

SERVICE: DUST & FUME SCRUBBING FROM DRYER   REF. STDS.: API-653 & API-650 (INCL. APPENDIX "M") LATEST EDITIONS
DESIGN PRESSURE: ATMOS. TO -35" W.G.   DESIGN TEMP.: 30°F MIN., 230°F MAX.   OPER. TEMP.: 160°F APPROX.
MAX. LIQ. LEVEL: 4'-8"   SPECIFIC GRAVITY OF PRODUCT: 1.33   CONTENTS: POND WATER

MATERIALS:

EXIST. & NEW SHELL:	ASTM A-36
REINFORCING PLATE:	ASTM A-36
PIPE (ALL NOZZS. EXCEPT "D" & "E"):	ASTM A-53 GR. B OR A-106 GR B
PIPE (NOZZS. "D" & "E"):	ASTM A-312 TP316L ST. STL.
FLANGE (ALL NOZZS. EXCEPT "D" & "E"): (FORGING)	ASTM A-105 (PLATE) ASTM A-36 (SEE NOTE "6")
PUMP SUCTION BAFFLES & SUPPORTS:	316L ST. STL.
FLANGE (NOZZS. "D" & "E")	ASTM A-182 F316L ST. STL.
BOLTING: (CADMIUM PLATED) (BOLTS)	ASTM A-193 GR.B7 (NUTS) ASTM A-194 GR 2H
GASKETS:	1/8" THK. NEOPRENE (70 DUROMETER)
INTALOX SADDLES:	POLYPROPYLENE
RUBBER LINING:	1/4" THK. RUBBER LINING TRIFLEX OR EQUAL (BOTTOM AND MANWAYS SHALL BE DOUBLE THICKNESS RUBBER LINED) (NOTE: RUBBER LINER TO VERIFY RUBBER AND THICKNESS SPECIFIED FOR THE SERVICE SHOWN)

SCOPE:

1. REMOVE ALL EXISTING INTERNALS AND PACKING.
2. DISPOSE OF EXISTING PACKING.
3. REMOVE EXISTING RUBBER LINING.
4. DESIGN, SUPPLY AND INSTALL LIFTING LUGS FOR RELOCATING VESSEL.
5. REMOVE EXISTING NOZZLES INDICATED ON DRAWING.
6. SUPPLY AND INSTALL NEW NOZZLES AS INDICATED ON DRAWING.
7. NON DESTRUCTIVE EXAMINATION OF ALL NEW WELDS AS INDICATED.
8. INSPECT AND REPAIR ALL DEFECTS.
9. INSTALL NEW RUBBER LINING SYSTEM.
10. REINSTALL EXISTING INTERNALS AND NEW PACKING SUPPLIED BY CARGILL.
11. SANDBLAST PRIME AND PAINT EXTERIOR OF VESSEL AS INDICATED.

GENERAL NOTES:

1. NOZZLE BOLT HOLES SHALL STRADDLE NATURAL NORTH/SOUTH TANK CENTERLINES OR THEIR PARALLELS UNLESS OTHERWISE NOTED.
2. ALL NOZZLE PROJECTIONS OR ELEVATIONS ARE TO THE FACE OF THE STEEL FLANGE.
3. SHELL NOZZLE PROJECTIONS ARE MEASURED FROM CENTER OF VESSEL TO FLANGE FACE.
4. RUBBER LINER SHALL FURNISH AND INSTALL ALL PARTS UNLESS OTHERWISE NOTED.
5. ALL INTERIOR WELDS MUST BE CONTINUOUS & SMOOTH w/ NO POROSITY, HIGH SPOTS, UNDERCUTTING, LUMPS OR POCKETS. ALL SHARP EDGES & CORNERS SHALL BE FILLED IN w/ WELD METAL AND/OR GROUND TO A 3/16" MINIMUM RADIUS.
6. PLATE FLANGES OF THE SAME THICKNESS w/ CL150 DRILLING MAY BE SUBSTITUTED IN LIEU OF THE FORGING SHOWN.
7. ALL INTERNAL CARBON STEEL SURFACES OF TANK AS WELL AS NOZZLE FLANGE FACES AND PIPE INTERIORS, SHALL BE RUBBER LINED IN ACCORDANCE WITH CARGILL SPECIFICATION TMG-0501-0010.
8. RUBBER LINING AT ALL FLANGE FACES SHALL BE 1/4" THICK.
9. APPLY "NEVER-SEEZ" TO SEALING SURFACES OF ALL RUBBER LINED BOLTED CONNECTIONS.
10. ALL NOZZLES SHALL HAVE REINFORCEMENT PLATE IN ACCORDANCE WITH API-650 DIMENSIONS.
11. NEW SHELL BUTT WELDS AND NEW WELDS ATTACHING THE NOZZLE NECK TO SHELL AND REINFORCING PLATE TO SHELL/NOZZLE NECK SHALL BE LIQUID PENETRANT EXAMINED IN ACCORDANCE WITH THE API-653 STANDARD.
12. EXTERIOR SURFACE PREPARATION SHALL BE IN ACCORDANCE WITH SSPC-SP-6.
13. EXTERIOR FINISH SHALL BE IN ACCORDANCE WITH SPECIFICATION TMG-0501-0007, PAINT SYS. 1.
14. AFTER COMPLETION OF RUBBER LINING, THE RUBBER LINING INSTALLER SHALL PAINT CLEARLY IN 6" HIGH LETTERS THE FOLLOWING WARNING SIGN: THIS TANK IS RUBBER LINED DO NOT WELD OR BURN
15. REMOVE NOZZLE AND ADJACENT PLATE SECTION LARGE ENOUGH TO ACCOMODATE NEW NOZZLE INSTALLATION.
16. INSTALL NEW BLIND FLANGE w/ BOLTS, NUTS AND GASKET AT EXISTING NOZZLES AS INDICATED.
17. A VISUAL INSPECTION OF THE ENTIRE VESSEL SHALL BE MADE. ANY AREAS SHOWING EXCESSIVE CORROSION OR DAMAGE SHALL BE SUBJECTED TO FURTHER TESTING AND/OR REPAIR.

NOZZLE SCHEDULE

SEE NOTE "6" (CLASS/FLG. FACE)

	CONN	QTY	SIZE	CLASS/FLG. FACE	SERVICE	NECK THCK	PROJECTION	ELEVATION	REMARKS
REMOVE	EXIST. A	1	16"	CL150/SO,FF	DRAIN	STD WT.	7'-3¼"	SEE DWG.	
REMOVE	EXIST. B	1	54"x54"	L2"x2"x¼"	GAS INLET	¼" THK.	7'-3¼"	SEE DWG.	w/ B.F. BOLTS, NUTS & GSKT
	EXIST. C	1	3"	CL150/SO,FF	COND. IN FROM VAPORIZER	SCH 40	7'-3¼"	SEE DWG.	
ADD BLIND FLANGE	EXIST. D	1	2"	CL150/SO,RF	SPARE SPRAY MOUNT	SCH 10S	7'-3¼"	SEE DWG.	
	EXIST. E1	1	10"	CL150/SO,RF	PARTING BOX FEED	SCH 10S	7'-4¼"	SEE DWG.	
	EXIST. E2	1	10"	CL150/SO,RF	PARTING BOX FEED	SCH 10S	7'-4¼"	SEE DWG.	
	EXIST. F	1	4"	CL150/SO,FF	LEVEL TRANSMITTER	SCH 40	7'-3¼"	SEE DWG.	
	EXIST. G	1	24"x100"	L2"x2"x¼"	INSP. DOOR w/ ¼" THK. COVER	¼" THK.	7'-3¼"	SEE DWG.	w/ BOLTS, NUTS & GSKT
	EXIST. H1	1	48"x48"	L2"x2"x¼"	MANWAY w/ ¼" THK. COVER	¼" THK.	7'-3¼"	SEE DWG.	w/ BOLTS, NUTS & GSKT.
	EXIST. H2	1	48"x48"	L2"x2"x¼"	MANWAY w/ ¼" THK. COVER	¼" THK.	7'-3¼"	SEE DWG.	w/ BOLTS, NUTS & GSKT.
	EXIST. J1	1	24"	L2"x2"x¼"	SHELL M.W. w/ ¼" THK. COVER	¼" THK.	7'-3¼"	SEE DWG.	w/ BOLTS, NUTS & GSKT
	EXIST. J2	1	24"	L2"x2"x¼"	ROOF M.W. w/ ¼" THK. COVER	¼" THK.	-----	SEE DWG.	w/ BOLTS, NUTS & GSKT
ADD BLIND FLANGES	EXIST. K	1	3"	CL150/SO,FF	SPARE	STD WT.	7'-3¼"	SEE DWG.	
ADD BLIND FLANGES	EXIST. L	1	18"	CL150/SO,FF	DRAIN (NOTE "16")	SCH 40	6'-6"	SEE DWG.	w/ BOLTS, NUTS & GSKT
	EXIST. M	1	8"	CL150/SO,FF	OVERFLOW	STD WT.	7'-3¼"	SEE DWG.	
REMOVE	EXIST. N	1	80"	CL150/SO,RF	GAS OUTLET	SCH 10S	7'-3¼"	SEE DWG.	
	EXIST. P1	1	3"	CL150/RF	PRESS./DIFF. & LEVEL TRANS.	-----	-----	SEE DWG.	STUDDING OUTLET
	EXIST. P2	1	3"	CL150/RF	PRESSURE DIFFERENTIAL	-----	-----	SEE DWG.	STUDDING OUTLET
	NEW AA	1	72"	L3"x3"x⅜"	GAS INLET	⅜" THK	7'-4"	SEE DWG.	SEE DETAIL AND NOTE "15"
	NEW BB	1	68"	L3"x3"x⅜"	GAS OUTLET	⅜" THK	-----	SEE DWG.	SEE DETAIL AND NOTE "15"
	NEW CC1	1	12"	CL150/SO,FF	OUTLET	SCH XS	7'-2"	SEE DWG.	SEE DETAIL AND NOTE "15"
	NEW CC2	1	12"	CL150/SO,FF	OUTLET	SCH XS	7'-2"	SEE DWG.	SEE DETAIL AND NOTE "15"

32-M-333	T.C. SCRBR. - DETS					
32-M-328	T.C. SCRBR. - ASSY	P1	FOR REVIEW	D.G.B.	E.C.	B.M.
REFERENCE DRAWINGS		REV	DATE	REVISION	BY	CHK	APP

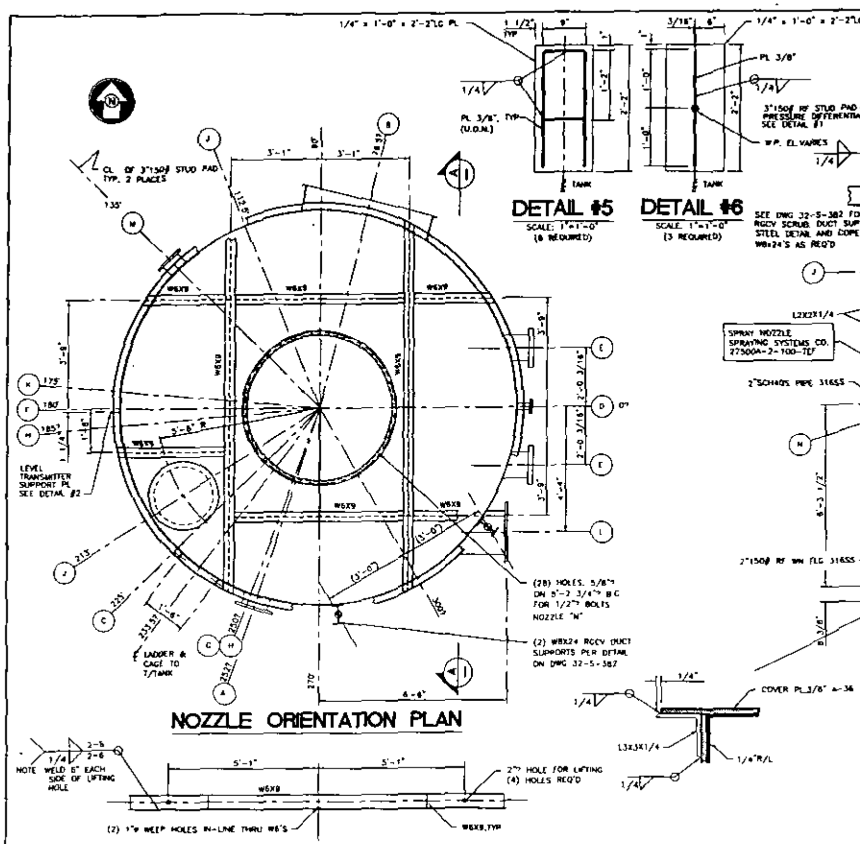
DRAWN BY: D.G.P.
SCALE: 3/8" = 1'-0" U.O.N.
CHECKED: E.C. DATE: 12-14-00
APP: P.R. DATE: 12-15-00

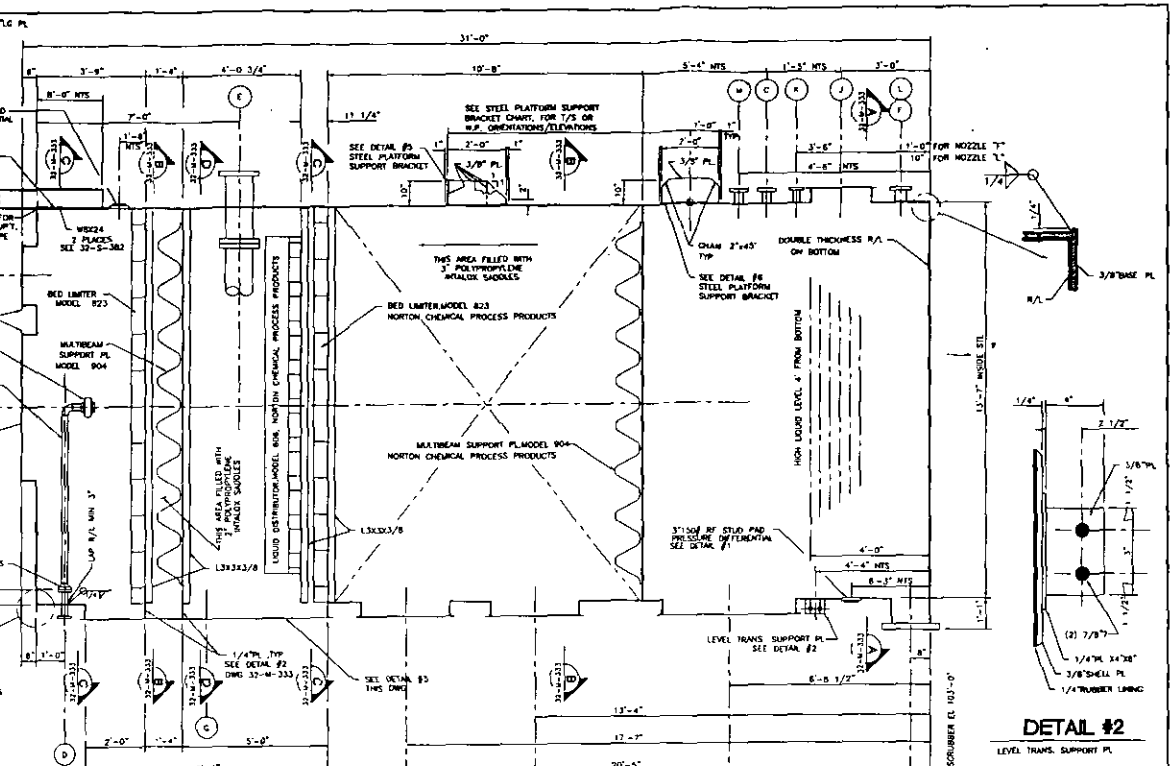
CARGILL FERTILIZER, Inc.

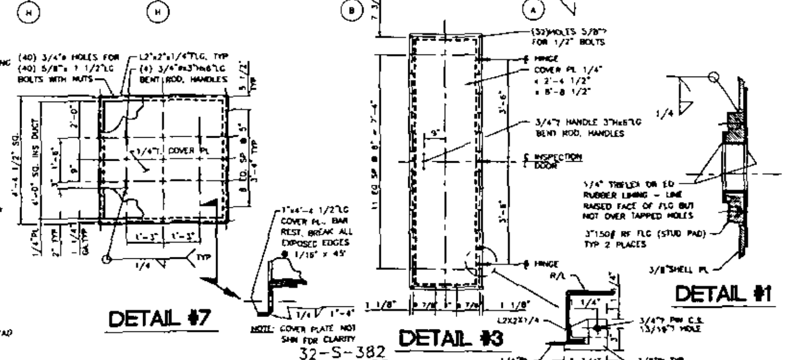
Cargill

GRANULATION PLANT
DRYER TAILGAS SCRUBBER - MODIFICATION DETAILS
ITEM NO. 37-1741

DATE: 12-11-00   DISCIPLINE: MECHANICAL   PROJECT: 200202
CAD FILE: 37M0015
37   M0015   REV P1







STEEL PLATFORM SUPPORT BRACKET CHART									
T/S OR W.P EL. REQUIREMENTS	QTY PER DETAIL		DETAIL CO-ORDINATES PER NOZZLE ORIENTATION PLAN						REMARKS
(NOTE: B/SCRUBBER EL 103'-0")	NO. 5	NO. 6	160°	185°	207.19°	222°	245°	270°	
KNEE-BRACE W.P. EL. 119'-8"		1					1		
T/SUP'T BRACKET EL. 122'-3"	3					1	1	1	
KNEE-BRACE W.P. EL. 117'-3"		1						1	
T/SUP'T BRACKET EL. 116'-8"	3		1	1	1				
KNEE-BRACE W.P. EL. 110'-2"		1			1				

NOZZLE SCHEDULE

MARK	NO. REQ'D	SIZE	RATING	NOZZLE NECK	PROJ/ OUTSIDE	FLANGE DATA	REINFORCING PAD	SERVICE	REMARKS
A	1	16"	150#	STD WT C.S.	13"	16"150# S.O.F.F FLG C.STL	NONE	DRAIN	DETAILED ON DWG 32-M-333
B	1	54"x34"	----	1/4"PL C.S.	6"	L2X2X1/4 R/L ANGLE	NONE	GAS INLET	DETAILED ON DWG 32-M-339
C	1	3"	150#	SCH40 C.S.	6"	3"150# S.O.F.F FLG C.STL	NONE	SUMP RETURN	DETAILED ON DWG 32-M-333
D	1	2"	150#	SCH10S,316L	6"	2"150# S.O. R.F. FLG 316SS	NONE	LATER	DETAILED ON DWG 32-M-333
E	2	10"	150#	SCH10S,316L	—	10"150# S.O. R.F. FLG 316SS	NONE	SPRAY HEADER	DETAILED ON DWG 32-M-333
F	1	4"	150#	SCH 40 C.S.	6"	4"150# S.O.F.F. FLG C.STL	NONE	LEVEL TRANSMITTER	DETAILED ON DWG 32-M-333
G	1	24"X100"	----	1/4"PL C.S.	6"	L2X2X1/4 R/L ANGLE	NONE	INSPECTION DOOR	DETAILED ON DWG 32-M-328
H	2	48"X48"	----	1/4"PL C.S.	6"	L2X2X1/4 R/L ANGLE	NONE	MANWAY	SEE DETAIL #7, THIS DRAWING
J	2	24"	----	1/4"PL C.S.	6"	L2X2X1/4 R/L ANGLE	NONE	MANWAY	DETAILED ON DWG 32-M-333
K	1	2"	150#	STD WT C.S.	6"	2"150# S.O. FLG C.STL	NONE	LEVEL TRANSMITTER	DETAILED ON DWG 32-M-333
L	1	18"	150#	SCH 40 C.S.	-	18"150# S.O.F.F. FLG C.STL	NONE	GRAVITY DRAIN	DETAILED ON DWG 32-M-333
M	1	8"	150#	STD WT C.S.	6"	8"150# S.O. FLG C.STL	NONE	OVERFLOW	DETAILED ON DWG 32-M-333
N	1	60"	----	1/4"PL C.S.	6"	L2X2X1/4 R/L ANGLE	NONE	GAS OUTLET	DETAILED ON DWG 32-M-333

NOTES

1. DESIGN STANDARDS:
   - DESIGN/FAB — AISC STANDARDS & ACCEPTED SHOP PRACTICE
   - DESIGN PRESSURE — LATER
   - DESIGN TEMP — LATER
   - CORROSION ALLOWANCE - NONE
   - RADIOGRAPHIC EXAM. — SPOT X-RAY
   - JOINT EFFICIENCY — 85%
   - HYDRO TEST PRESSURE - FILL W/WATER & HOLD 3 HOURS BEFORE RUBBER LINING
   - SPARK TEST RUBBER LINING TO 15000V
2. MATERIAL:
   - SHELL — ASTM A-36,3/8"PL
   - COVERS — ASTM A-36,3/8"PL
   - NOZZLE NECKS — SEE TABLE
   - NOZZLE FLANGES — SEE TABLE
   - M/H FLANGE — SEE TABLE
   - M/H NECK — SEE TABLE
   - REINFORCING PADS — ASTM A-36,1/4"PL
   - GASKETS — 1/8" SOFT NATURAL RUBBER
   - BOLTS — A 307 B GALV.
   - NUTS — A 307 B GALV.
3. SURFACE PREP. AND FINISH
   - INTERIOR — 1/4"THK RUBBER LINING TRIFLEX OR EQ (BOTTOM & MANWAYS TO BE DOUBLE THICKNESS RUBBER LINED
   - EXTERIOR — PAINT PER CARGILL SPECIFICATIONS
4. WEIGHT EMPTY (APPROX) LATER
5. CAPACITY (APPROX.) LATER
6. WEIGHT FULL OF WATER (APPROX) 300,000#
7. CUSTOMER INSPECTION IS REQUIRED
8. FLANGE BOLT HOLES TO STRADDLE NATURAL VESSEL CENTERLINES U.O.N.
9. ALL FLANGE FACES AND COUPLINGS TO BE PROTECTED FOR SHIPMENT
10. INTERNAL FILLET WELDS & SHARP EDGES SHALL BE GROUND TO MIN OF 1/4"RAD
11. INSTALLATION
    - A. USE TEMPLETE FOR SETTING OF ANCHOR BOLTS
    - B. DELETED
    - C. DELETED
    - D. TEST WATER TO BE SUPPLIED AND DISPOSED OF BY CARGILL FERTILIZER (FORMERLY GARDINIER)
    - E. GRIND ALL CORNERS TO 1/4" MIN. RADIUS.
    - F. ALL INSIDE SEAM WELDS TO BE GROUND FLUSH W/INTERIOR TANK SURFACE W/NO VALLEYS OR UNDERCUTS
    - G. REMOVE ALL WELD SPATTER (INSIDE AND OUTSIDE).
12. TOLERENCES. BILATERAL TOL ON LOCATING BOLTS ±1/16", FAB TOL ±1/16"

32-S-382

NOTE: WORK THIS DWG WITH 32-M-333.

REF DRAWINGS	NO.	DATE	REVISION	BY	CK	APP
32-S-382						
32-M-333						
C17-81542-10	3	07-23-92	[illegible]	EM		
33-6831	2	06-23-92	[illegible]	EM		
22-6823	1	06-04-92	DELETED DETAIL 4	EM		
22-6827	0	04-13-92	ISSUED FOR CONSTRUCTION	EM		

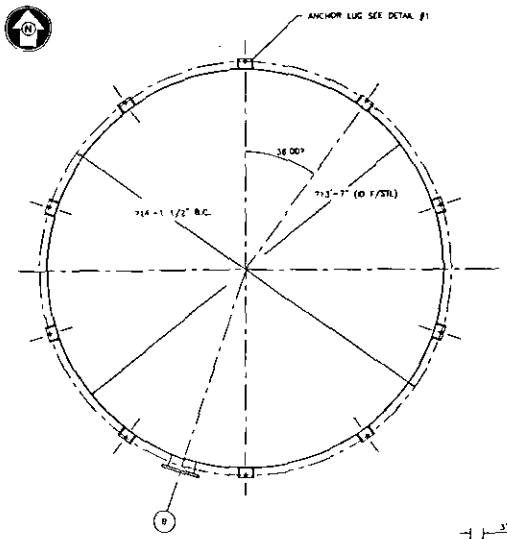
CARGILL FERTILIZER, INC.

CAD FILE | PLOT SCALE 1/2"=1'-0" | JOB NO.

GTSP PLANT
DRYER TAIL-GAS SCRUBBER
PLAN,ELEVATION & DETAILS

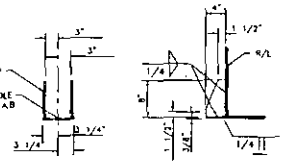
SCALE 1/2"=1'-0" DATE 3-27-92

DR E. MORRIS | DR NO. 32-M-328



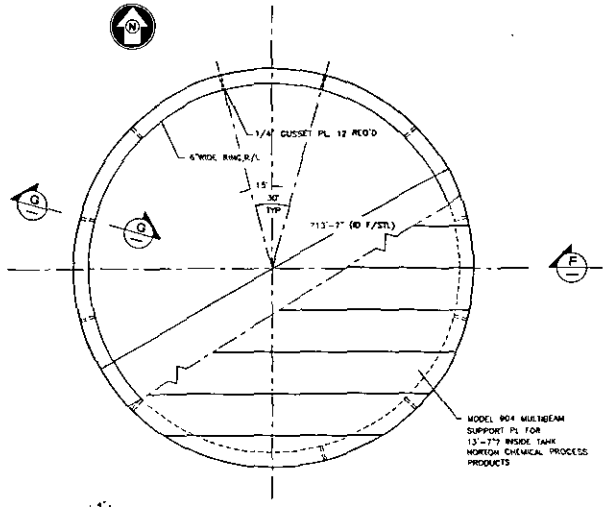
SECTION A-A

DWG 32-M-328



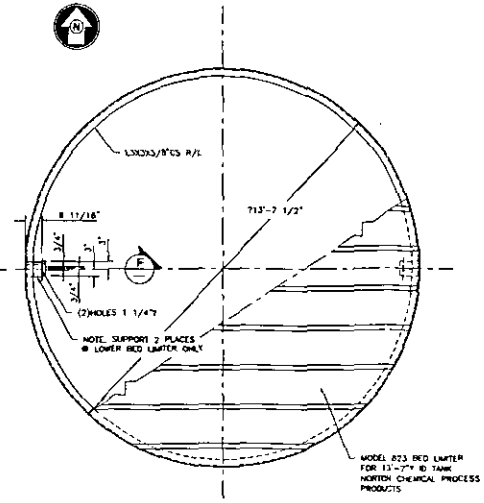
DETAIL #1

SCALE 1"=1'-0"



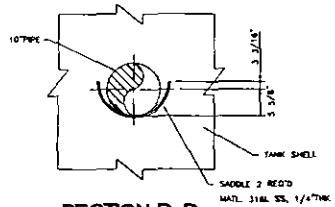
SECTION B-B

DWG 32-M-328



SECTION C-C

DWG 32-M-328



SECTION D-D

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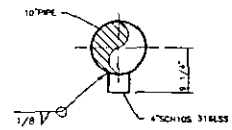
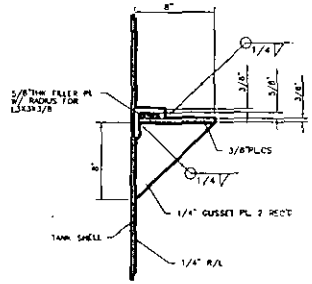


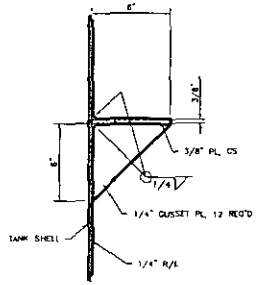
SECTION E-E

SCALE 1"=1'-0"



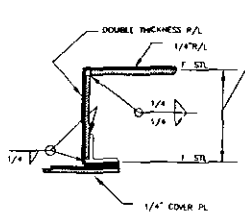
SECTION F-F

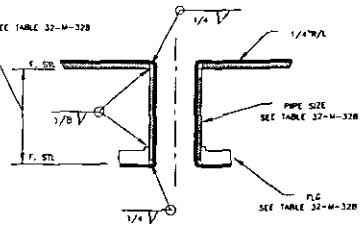
SCALE 1 1/2" =1'-0"



SECTION G-G

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



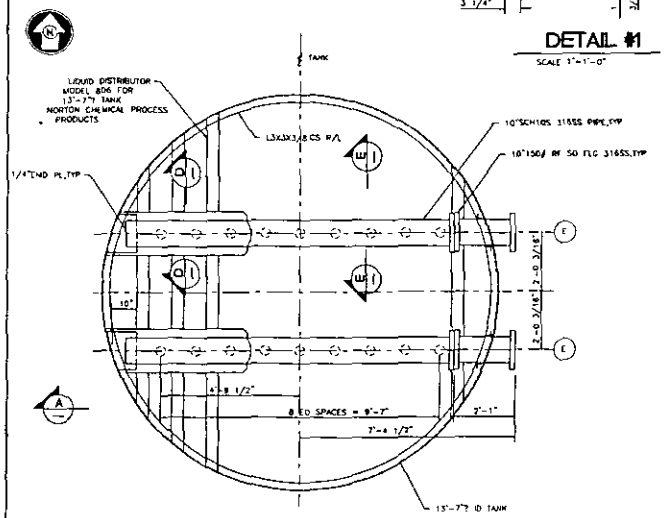


TYP NOZZLE DETAIL #3

SCALE NONE	
NOZZLE	A
NOZZLE	G
NOZZLE	H
NOZZLE	J
NOZZLE	N

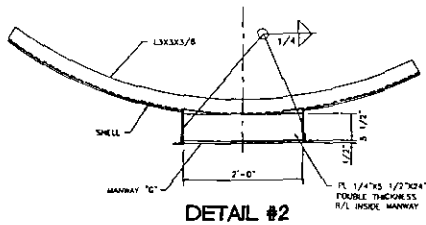
TYP NOZZLE DETAIL #4

SCALE NONE	
NOZZLE	B
NOZZLE	C
NOZZLE	D
NOZZLE	F
NOZZLE	K
NOZZLE	M



SECTION D-D

DWG 32-M-328



DETAIL #2

R/L NOT SHOWN FOR CLARITY

WORK THIS DWG WITH 32-M-328

REF DRAWINGS	NO.	DATE	REVISION	BY	CK	APP
32-M-328						
32-6603						
	0	04-13-92	ISSUED FOR CONSTRUCTION	EM		

CARGILL FERTILIZER, INC.
8813 HIGHWAY 41 NORTH
RIVERVIEW, FLORIDA 33569
(813) 677-8111

CAD FILE: 32-M-333.DWG | PLOT SCALE: 1/2"=1'-0" | JOB NO.

DRYER R-6004 TAIL-GAS SCRUBBER
GTSP PLANT
SCRUBBER DETAILS & SECTIONS

SEC. MECHANICAL | SCALE: 1/2"=1'-0" | DATE

DR E. MORRIS | DR NO. 32-M-333

CH | DATE

ATTACHMENT B

Attachment B, List of Attachments

Drawing Number	Drawing Title
37-2211	Data Sheet Pipe Reactor (Sheet 1 of 2)
37-2211	Data Sheet Pipe Reactor (Sheet 2 of 2)
37-2375	Data Sheet Vessel (Sheet 1 of 3)
37-2375	Data Sheet Vessel (Sheet 2 of 3)
37-2375	Data Sheet Vessel (Sheet 3 of 3)
37 M0012 1	No. 6 Granulation Plant Reactor
37 M0013 1	No. 6 Granulation Plant Reactor Sections and Details
37 M0019 1	No. 6 Granulation Plant Reactor Tank Top Structural Support Detail

incro	DATA SHEET PIPE REACTOR	Client: CARGILL -TAMPA Plant: DAF #6 PLANT Location: TAMPA - USA Date: Nov-03	Sheet 1 of 2

Item	37-2211	Specification	03-0011-37-2211
Nr required	1	Manufacturer	INCRO S.A.
Service	PIPE REACTOR	Model	RT 60
Project	03-0011	Type	INCRO S.A. DESIGN

UNIT DESCRIPTION

TYPE: Mixing and reacting head plus distributing tube, located inside granulator.

OPERATING CONDITIONS

Feedings	Partially ammoniated phosacid, liquid ammonia and steam		
Flow	Slurry	t/h	40 - 55 / 60 design
	Liquid ammonia	lb/h	15000 - 20000 / 24000 design
	Acid	gal/min	130 - 175 / 200 gal/min
	Steam	lb/h	8000 only for flushing
Temperature		°F	250 – 300 / 500 max
Pressure	Normal / design	psi	40 – 60 / 200

SIZE

	Pipe reactor tube	6"
	Ammonia nozzle	2"
	PhosAcid nozzle	3"

MATERIALS

	Mixing head	SS904L
	Inlet connections	SS904L
	Discharge tube	SS316L
	Gaskets	Teflon

DIMENSIONS

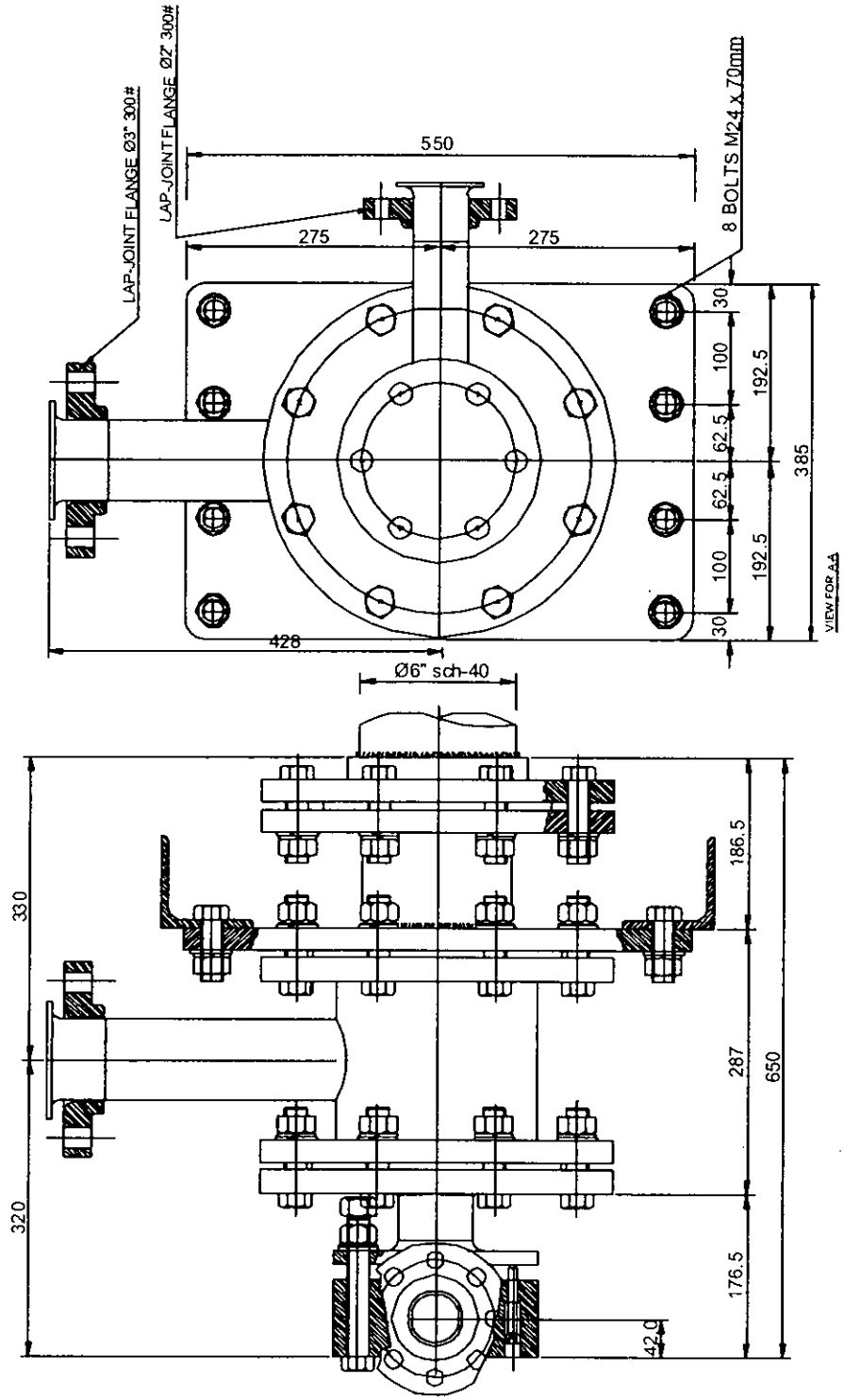
See attached sketch	Complete information to be given on granulator internals drawings supplied by INCRO S.A.

NOTES.-

ISSUE	DATE	DESCRIPTION OF ISSUE	CHK'D	APP'D
0	Nov-03	BASIC ENGINEERING	R.A.F.	S.C.C.

incro	**DATA SHEET** **PIPE REACTOR**	Client:	CARGILL.-TAMPA	
		Plant:	DAF #6 PLANT	
		Location:	TAMPA - USA	
		Date:	Nov-03	Sheet 2 of 2

Item	37-2211	Specification	03-0011-37-2211
Nr required	1	Manufacturer	INCRO S.A.
Service	PIPE REACTOR	Model	RT 60
Project	03-0011	Type	INCRO S.A. DESIGN



0	Nov-03	BASIC ENGINEERING	R.A.F.	S.C.C.
ISSUE	DATE	DESCRIPTION OF ISSUE	CHK'D	APP'D

incro	DATA SHEET VESSEL	Client: CARGILL -TAMPA	
		Plant: DAF #6 PLANT	
		Location: TAMPA - USA	
		Date: Nov-03	Sheet 1 of 3

Item	37-2375
Nr required	1
Service	PIPE REACTOR TANK
Project	03-0011

SEE ATTACHED SKETCH

Specification	03-0011-37-2375		
Manufacturer			
Model			
Type	Cylindrical vessel		
DESIGN DATA			
Fluid	40-48 % P_2O_5. N/P=0.05-0.5, 10% solids. 5 % H_2SO_4 maximum. Traces Cl^-, F^-.		
Density	lb/ft^3		93-100
Service pressure absolute			Atmospheric+liquid column
Design pressure			Relative
Internal			Atmospheric+liquid column
External or vacuum			Atmospheric
Temperature	°F		160-200 / 220 design
Corrosion allowance	inch		1/15
Design Code			ASME VIII – 1
REQUIRED BY PROCESS			
Radiography : full / spot / none			None
Stress relief			None
INSULATION			
Required/Type			None
SIZE	Diameter	ft	11
	Height	ft	11
VOLUME		ft^3	900 / 1000 design

MATERIALS (3) (4)	
Shell	Rubber lining - carbon steel
Heads	Rubber lining - carbon steel
Internals	Rubber lining - carbon steel
Bottom & 1m shell	Rubber lining – carbon steel
Internal lining	Butil rubber IIR
Bolts / nuts	AISI 316

NOZZLES

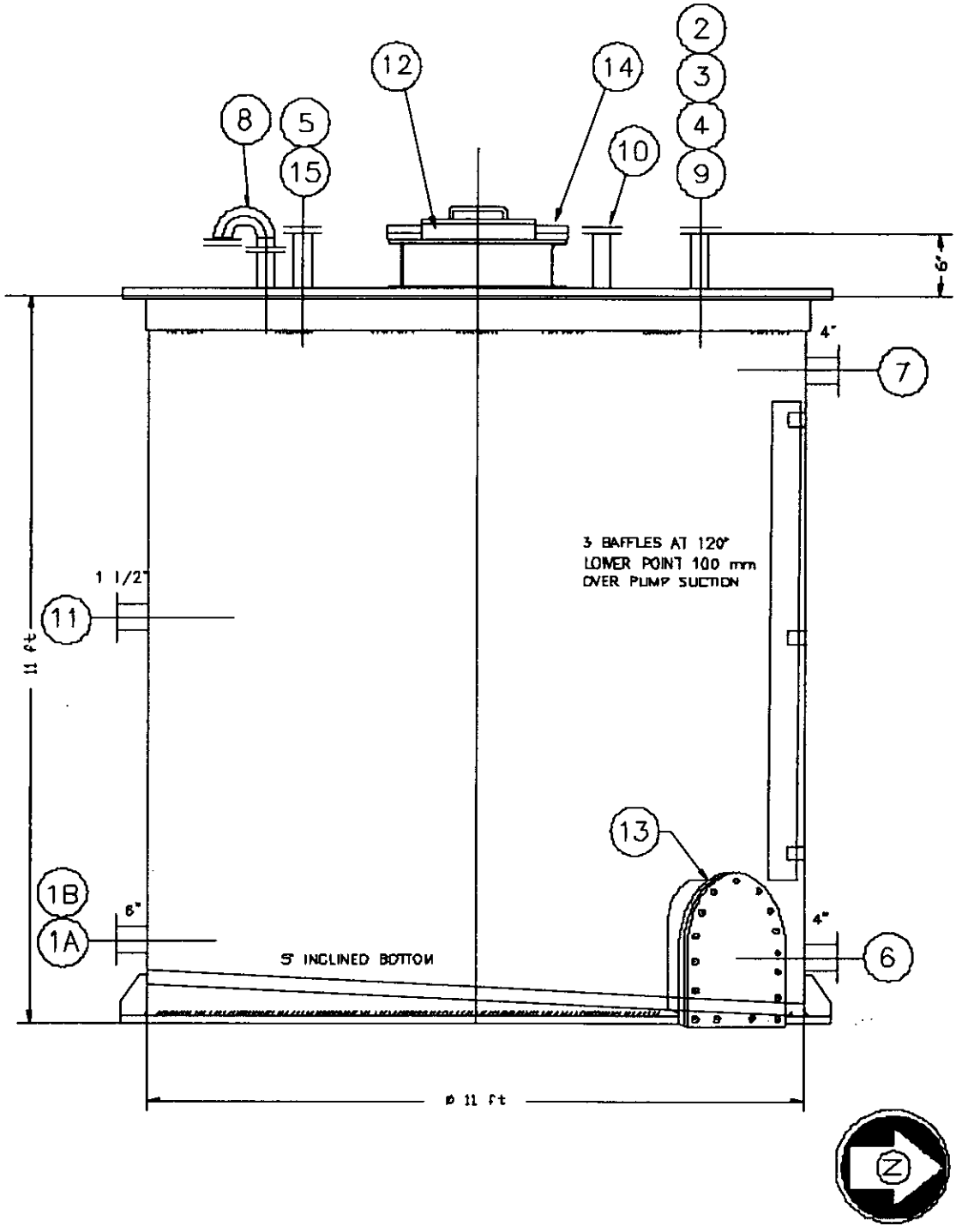
Mark	Size	Qty.	Service
1 A/B	6 inch	2	Suction pumps
2	4 inch	1	52% Phosacid inlet
3	4 inch	1	30% Phosacid inlet
4	4 inch	1	from Pre-scrubber
5	3 inch	1	Pumps return
6	4 inch	1	Drain
7	4 inch	1	Overflow
8	3 inch	1	Vent
9	1 ½ inch	1	Defoamer pump
10	4 inch	1	Level transmitter
11	1 ½ inch	1	Temperature indicator
12	(2)	1	Agitator support
13	24 inch	1	Flush type manhole
14	24 inch	1	Manhole
15	4 inch	1	Spare

NOTES.- (1) Phosacid and scrubbing liquor inlets have to install a deep pipe (300 mm deep) of AISI 316 to avoid solids abrasion. accordingly, size of the nozzles has been increased. (2) To be given by agitator vendor.
(3) All internal welding will be ground smooth flush. (4) Hardness of rubber 55/60 shore. To be confirmed by vendor.
(5) Minimum size 1 ½" for RLCS.

ISSUE	DATE	DESCRIPTION OF ISSUE	CHK'D	APP'D
0	Nov-03	BASIC ENGINEERING	R.A.F.	S.C.C.

incro	DATA SHEET VESSEL	Client:	CARGILL -TAMPA	
		Plant:	DAF #6 PLANT	
		Location:	TAMPA - USA	
		Date:	Nov-03	Sheet 2 of 3

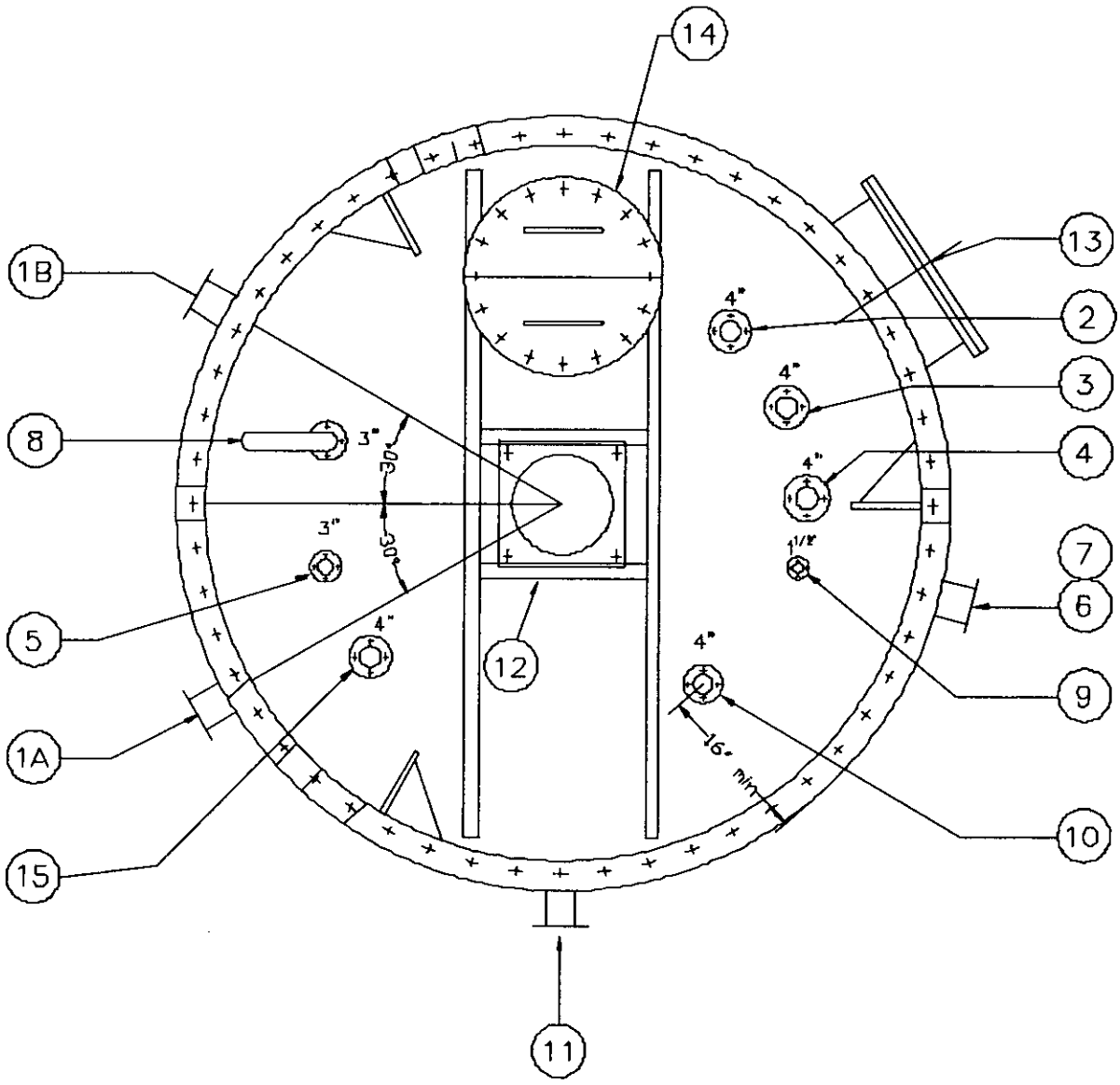
Item	37-2375	Specification	03-0011-37-2375
Nr required	1	Manufacturer	
Service	PIPE REACTOR TANK	Model	
Project	03-0011	Type	Cylindrical vessel



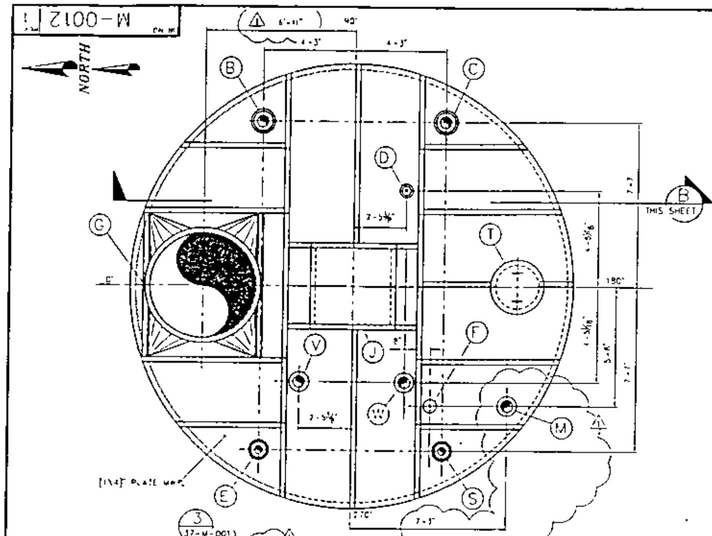
0	Nov-03	BASIC ENGINEERING	R.A.F.	S.C.C.
ISSUE	DATE	DESCRIPTION OF ISSUE	CHK'D	APP'D

incro	DATA SHEET VESSEL	Client: CARGILL -TAMPA	
		Plant: DAP #6 PLANT	
		Location: TAMPA - USA	
		Date: Nov-03	Sheet 3 of 3

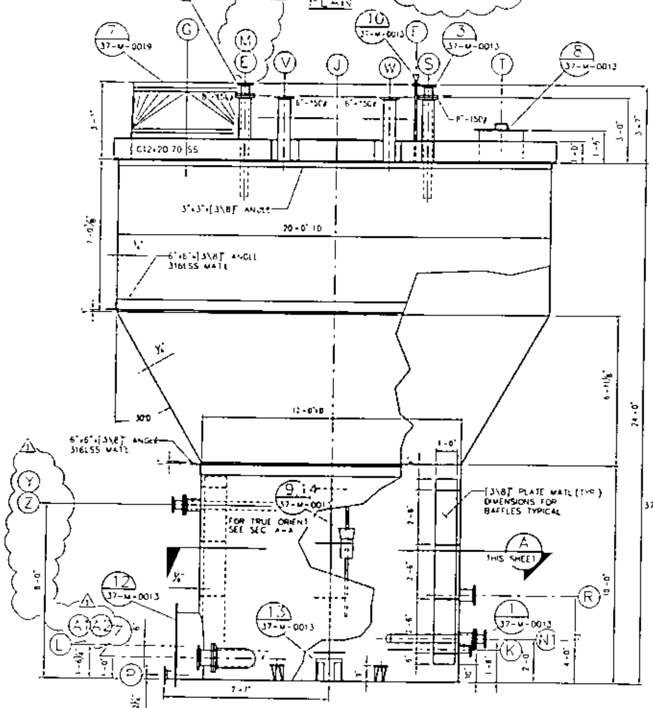
Item	37-2375	Specification	03-0011-37-2375
Nr required	1	Manufacturer	
Service	PIPE REACTOR TANK	Model	
Project	03-0011	Type	Cylindrical vessel



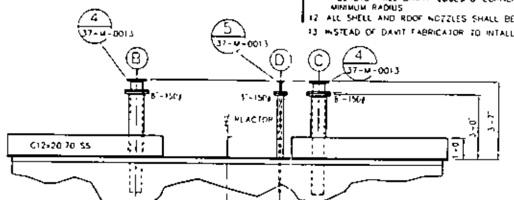
0	Nov-03	BASIC ENGINEERING	R.A.F.	S.C.C.
ISSUE	DATE	DESCRIPTION OF ISSUE	CHK'D	APP'D



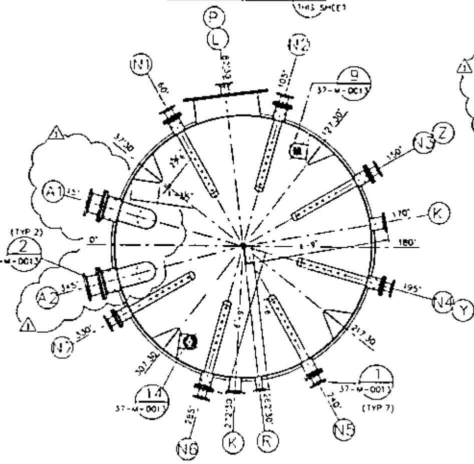
PLAN



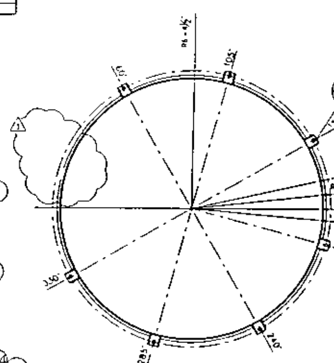
ELEVATION
(NOT TRUE ORIENTATION)



SECTION B



SECTION A



FOOT PATTERN

NOZZLE SCHEDULE

CONN	QTY	SIZE	CLASS/ FLG FACE	SERVICE	NECK THICK	REMARKS
A1	1	10"	150#/SORF	PUMP SUCTION	STD WT	SEE DWG 37-M-0013 DETAIL 2 FOR INSERT
A2	1	10"	150#/SORF	PUMP SUCTION	STD WT	SEE DWG 37-M-0013 DETAIL 2 FOR INSERT
B	1	8"	150#/SORF	52% P2O5 INLET W/ INSERT	STD WT	SEE DWG 37-M-0013 DETAIL 4 FOR INSERT
C	1	8"	150#/SORF	52% P2O5 INLET W/ INSERT	STD WT	SEE DWG 37-M-0013 DETAIL 4 FOR INSERT
D	1	3"	150#/SORF	H2SO4 INLET W/ INSERT	STD WT	SEE DWG 37-M-0013 DETAIL 5 FOR INSERT
E	1	6"	150#/SORF	SCRUBBER LIQUOR W/ INSERT	STD WT	SEE DWG 37-M-0013 DETAIL 3 FOR INSERT
F	1	1"	150#/SORF	DEFOAMER	STD WT	SEE DWG 37-M-0013 DETAIL 10 FOR INSERT
G	1	58"	150#/PL F/F	VENT TO SCRUBBER	STD WT	SEE DWG 37-M-0019 DETAIL 7
H						
J	1	24"	150#/PL F/F	OPENING FOR AGITATOR BLADES	STD WT	
K	2	6"	150#/SORF	LEVEL TRANSMITTER	STD WT	INSERT PROVIDED BY CARGILL E&I
L	1	36"×36"	API 650	CLEAN-OUT	STD WT	SEE DWG 37-M-0013 DETAIL 12
M	1	6"	150#/SORF	SCRUBBER LIQUOR W/ INSERT	STD WT	SEE DWG 37-M-0013 DETAIL 3 FOR INSERT
N1	1	6"	150#/SORF	AMMONIA INLET W/ SPARGER	STD WT	SEE DWG 37-M-0013 DETAIL 1 FOR SPARGER
N2	1	6"	150#/SORF	AMMONIA INLET W/ SPARGER	STD WT	SEE DWG 37-M-0013 DETAIL 1 FOR SPARGER
N3	1	6"	150#/SORF	AMMONIA INLET W/ SPARGER	STD WT	SEE DWG 37-M-0013 DETAIL 1 FOR SPARGER
N4	1	6"	150#/SORF	AMMONIA INLET W/ SPARGER	STD WT	SEE DWG 37-M-0013 DETAIL 1 FOR SPARGER
N5	1	6"	150#/SORF	AMMONIA INLET W/ SPARGER	STD WT	SEE DWG 37-M-0013 DETAIL 1 FOR SPARGER
N6	1	6"	150#/SORF	AMMONIA INLET W/ SPARGER	STD WT	SEE DWG 37-M-0013 DETAIL 1 FOR SPARGER
N7	1	6"	150#/SORF	AMMONIA INLET W/ SPARGER	STD WT	SEE DWG 37-M-0013 DETAIL 1 FOR SPARGER
P	1	6"	150#/SORF	DRAIN	STD WT	SEE DWG 37-M-0013 DETAIL 12
R	1	3"	150#/SORF	TEMPERATURE ELEMENT	STD WT	SEE THIS DWG
S	1	6"	150#/SORF	SLURRY W/ INSERT	STD WT	SEE DWG 37-M-0013 DETAIL 3 FOR INSERT
T	1	24"	150#/PL F/F	MANWAY	STD WT	SEE DWG 37-M-0013 DETAIL 6
V	1	6"	150#/SORF	DENSITY	STD WT	INSERT PROVIDED BY CARGILL E&I
W	1	6"	150#/SORF	SPARE	STD WT	
Y	1	6"	150#/SORF	30% P2O5 INLET W/ INSERT	STD WT	SEE DWG 37-M-0013 DETAIL 3 FOR INSERT
Z	1	6"	150#/SORF	30% P2O5 INLET W/ INSERT	STD WT	SEE DWG 37-M-0013 DETAIL 3 FOR INSERT

GENERAL NOTES

1. NOZZLE BOLT HOLES SHALL STRADDLE NATURAL NORTH/SOUTH TANK CENTERLINES OR THEIR PARALLELS UNLESS OTHERWISE NOTED
2. ALL NOZZLE PROJECTIONS OR ELEVATIONS ARE TO THE FACE OF THE STEEL FLANGE
3. SHELL NOZZLE PROJECTIONS ARE MEASURED FROM CENTER OF TANK TO FLANGE FACE
4. SHELL NOZZLE ELEVATIONS ARE MEASURED VERTICALLY FROM THE UNDERSIDE OF THE TANK BOTTOM TO THE CENTERLINE OF THE NOZZLE
5. ROOF NOZZLE ELEVATIONS ARE MEASURED VERTICALLY FROM THE UNDERSIDE OF THE TANK TO THE FLANGE FACE
6. FABRICATOR SHALL FURNISH AND INSTALL ALL PARTS UNLESS OTHERWISE NOTED
7. # INDICATES VENDOR TO VERIFY OR SPECIFY
8. DELETED
9. COMPLETE WITH COVER, HANDLES, BOLTS, NUTS AND GASKET
10. COMPLETE WITH BLIND FLANGE, BOLTS, NUTS AND GASKET
11. ALL INTERIOR WELDS MUST BE CONTINUOUS & SMOOTH W/ NO POROSITY, HIGH SPOTS, UNDERCUTTING, LUMPS OR POCKETS. ALL SHARP EDGES & CORNERS SHALL BE FILLED IN W/ WELD METAL AND/OR GROUND TO A 3/6" MINIMUM RADIUS
12. ALL SHELL AND ROOF NOZZLES SHALL BE REINFORCED IN ACCORDANCE WITH API-650
13. INSTEAD OF DAVIT FABRICATOR TO INTALL AN EYE PAD TO REMOVE CLEAN-OUT DOOR

DESIGN DATA

SERVICE		REACTOR SLURRY		
		API-650 LATEST EDITION		
APPLICABLE CODE APPENDICES		######		
DESIGN PRESSURE	INTERNAL	X" WG	DESIGN TEMP MINIMUM	###°F
	EXTERNAL	-X" WG	DESIGN TEMP MAXIMUM	###°F
OPERATING PRESSURE	INTERNAL	ATM	OPERATING TEMP MINIMUM	###°F
	EXTERNAL	NONE	OPERATING TEMP MAXIMUM	###°F
LIQUID LEVELS	MINIMUM	XX'-X"	PUMPING RATES IN	### GPM
	OPERATING	XX'-X"	PUMPING RATES OUT	### GPM
	MAXIMUM	XX'-X"	ROOF LOADS UNIFORM	25 / 95 / 50 ##
			ROOF LOADS SPECIAL	-----
PRODUCT STORED		REACTOR SLURRY		
PRODUCT SPECIFIC GRAVITY		97LB[3]		
WIND DESIGN		PER API-650		
SEISMIC DESIGN		NOT REQUIRED		
FOUNDATION TYPE		REINFORCED CONCRETE MAT		
CORROSION ALLOWANCE	SHELL	-----	ROOF	-----
	BOTTOM	-----	STRUCTURALS	-----
		-----	REMOVABLE INTERNALS	-----
	ANCHOR BOLTS	-----		
CAPACITIES	MAXIMUM (XX'-X")			## ### GALS
	OPERATING (MIN XX'-X") XX,XXX GALS (NORM XX'-X")			## ### GALS
	NET WORKING			## ### GALS
WEIGHTS	EMPTY BY VENDOR LBS		FABRICATED	BY VENDOR LBS
	OPERATING (MIN) BY VENDOR LBS		(MAX)	BY VENDOR LBS
	FULL OF WATER			BY VENDOR LBS
	FULL OF OPERATING FLUID			BY VENDOR LBS
FORCES	MAXIMUM OVERTURNING MOMENT AT BASE			BY VENDOR FT LBS
	MAXIMUM SHEAR AT BASE			BY VENDOR FT LBS

INSPECTION ~~AND~~ TESTING

INSPECTION BY			
WELD EXAM	RADIOGRAPHY SPOT PER API-650	LEAK TESTING	BOTT VAC BOX/SOAP SUDS
	SUPPL ULTRASONIC -----		SHELL WATER FILL PER CODE
			ROOF AIR PRESS/SOAP SUDS
MILL TEST REPORTS REQUIRED	YES		

CONSTRUCTION DETAILS

ROOF TYPE		FLAT
ROOF SLOPE OR RADIUS		N/A
BOTTOM TYPE		FLAT
PLATE SEAMS	ROOF	BUTT WELD
	BOTTOM	BUTT WELD

TANK APPURTENANCES

LADDER/ STAIRWAY	SUPPLIER	ON SITE FABRICATION
	TYPE	N/A
	STRAIGHT STAIRWAY SLOPE	-----
BREATHER VALVE		REQUIRED
FLAME ARRESTOR		-----
LEVEL INDICATOR		REQUIRED
DIP HATCH		-----
DRAW OFF SUMP		-----
AGITATOR SUPPORTS, PLATFORM & H.R.		

MISCELLANEOUS

PAINTING		EXTERIOR ONLY PER SPECIFICATION
EXTENT OF PAINTING	INTERNAL	NOT REQUIRED
	EXTERNAL	NOT REQUIRED
LINING		REQUIRED (SEE MATERIALS BELOW)
INSULATION		NONE

REFERENCE STANDARDS AND SPECIFICATIONS

STORAGE TANKS	NOT APPLICABLE
PAINTING	NOT APPLICABLE

MATERIALS

SHELL		316LSS
ROOF		316LSS
BOTTOM		316LSS
LINING		NOT APPLICABLE
FORGINGS		A-182
NOZZLES	FLANGES	(FORGING) A182 SLIP ON RF
	NECKS	(PIPE) A312 STD WT
	REINF	2"[1/4]" THK PLATE MAT'L 316LSS
MANHOLES AND/OR HANDHOLES	FLANGES	PER API 650
	NECKS	PER API 650
	COVERS	PER API 650
	REINF	PER API 650
GASKETS	NOZZLES	1/8" THK FULL FACE NEOPRENE (70 DUROMETER)
	MANHOLES	1/8" THK FULL FACE NEOPRENE (70 DUROMETER)
	INTERNALS	1/8" THK FULL FACE NEOPRENE (70 DUROMETER)
INTERNAL BOLTING	BOLTS	316LSS
	NUTS	316LSS
EXTERNAL BOLTING	STUDS/BOLTS	316LSS
	NUTS	316LSS
INTERNALS	PIPE	316LSS
	PLATE	316LSS
	STRUCTURALS	316LSS
EXTERNALS	PLATE	316LSS
	STRUCTURALS	316LSS

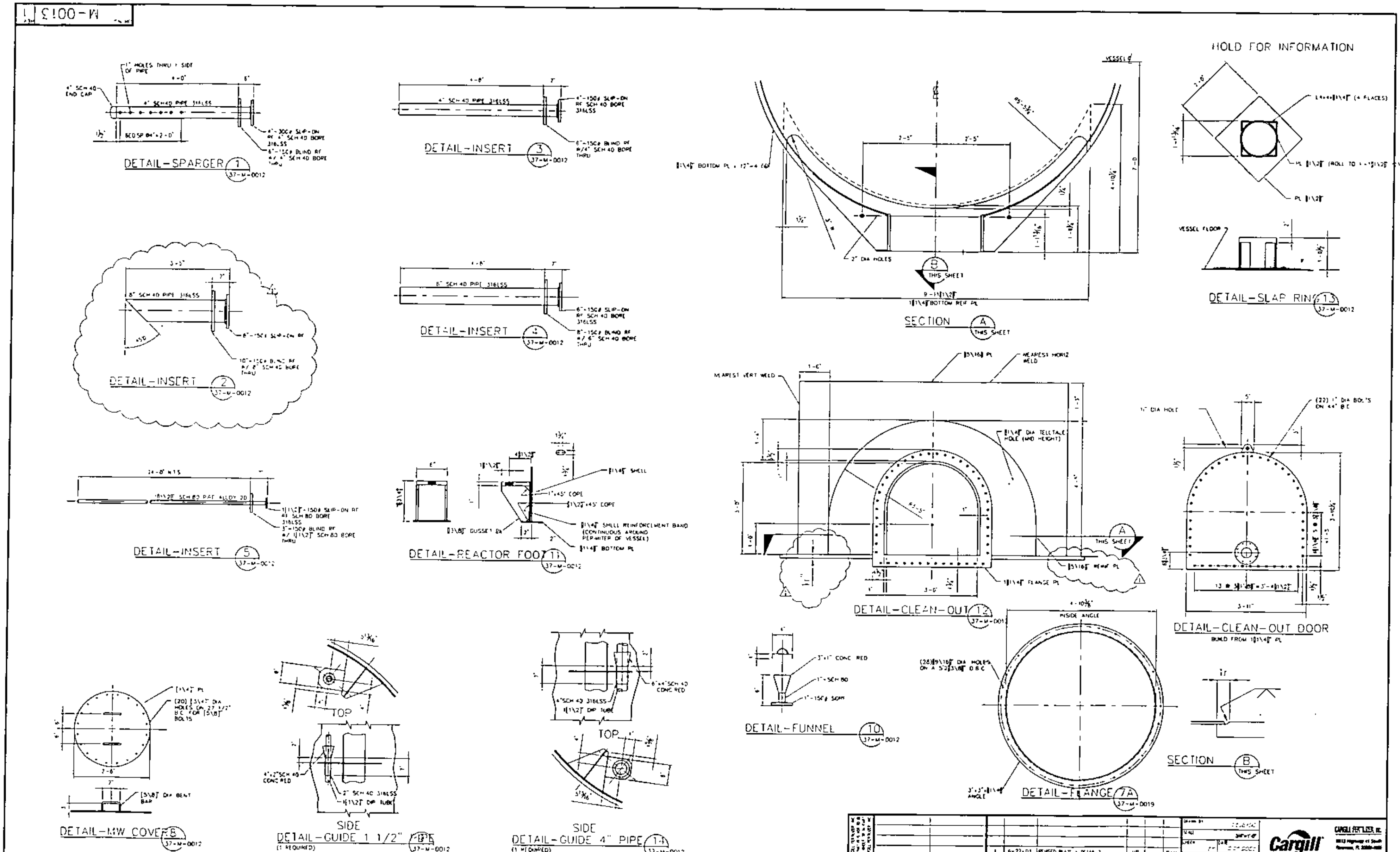
REFERENCE DRAWINGS

NO	DATE	REVISION	BY	CH	APP
1	6-27-03	REVISED NOZZLES, DELETE HOLD DOWN	MB		RAM
D	06-26-03	FOR ERECTION BID	GD	EC	BH
D	4-30-2003	ISSUED FOR CONSTRUCTION	GD	BH	BH
P4	4-7-2003	REVISED BID	GD	BH	BH
P3	3-25-2003	ISSUED FOR APPROVAL & BID	GD	BH	BH
P2	3-6-2003	PRELIMINARY	GD	JLG	BH
P1	2-27-2003	PRELIMINARY	GD	BH	BH

CARGILL FERTILIZER, Inc

#6 GRANULATION PLANT
REACTOR
ITEM NO. 37-2310

DATE 2-27-2003 | DISCIPLINE MECHANICAL | PROJECT 200202
CAD FILE M-0012 | 37 | M-0012 | REV 1


M-0013 1
HOLD FOR INFORMATION
DETAIL-SPARGER 1 37-M-0012
DETAIL-INSERT 3 37-M-0012
DETAIL-INSERT 2 37-M-0012
DETAIL-INSERT 4 37-M-0012
DETAIL-INSERT 5 37-M-0012
DETAIL-REACTOR FOOT 11 37-M-0012
SECTION A THIS SHEET
DETAIL-SLAP RING 13 37-M-0012
DETAIL-CLEAN-OUT 12 37-M-0012
DETAIL-CLEAN-OUT DOOR
BUILD FROM 1/4" PL
DETAIL-FUNNEL 10 37-M-0012
DETAIL-FLANGE 7A 37-M-0019
SECTION B THIS SHEET
DETAIL-MW COVER 8 37-M-0012
TOP
SIDE
DETAIL-GUIDE 1 1/2" PIPE 37-M-0012
(1 REQUIRED)
DETAIL-GUIDE 4" PIPE 14 37-M-0012
(1 REQUIRED)

NO	DATE	REVISION	BY	CK	APP
1	6-27-03	REVISED PLATE & DETAIL 7	MB		RAH
0	06-26-03	FOR ERECTION BID	CD	EC	BH
0	4-30-2003	ISSUED FOR CONSTRUCTION	CC	BH	BH
P4	4-7-2003	REVISED BID	CD	BH	BH
P3	3-25-2003	ISSUED FOR APPROVAL & BID	CD	BH	BH
P2	3-5-2003	PRELIMINARY	CD	JEG	BH
P1	2-27-2003	PRELIMINARY	CD	JEG	BH

REFERENCE DRAWINGS

Cargill

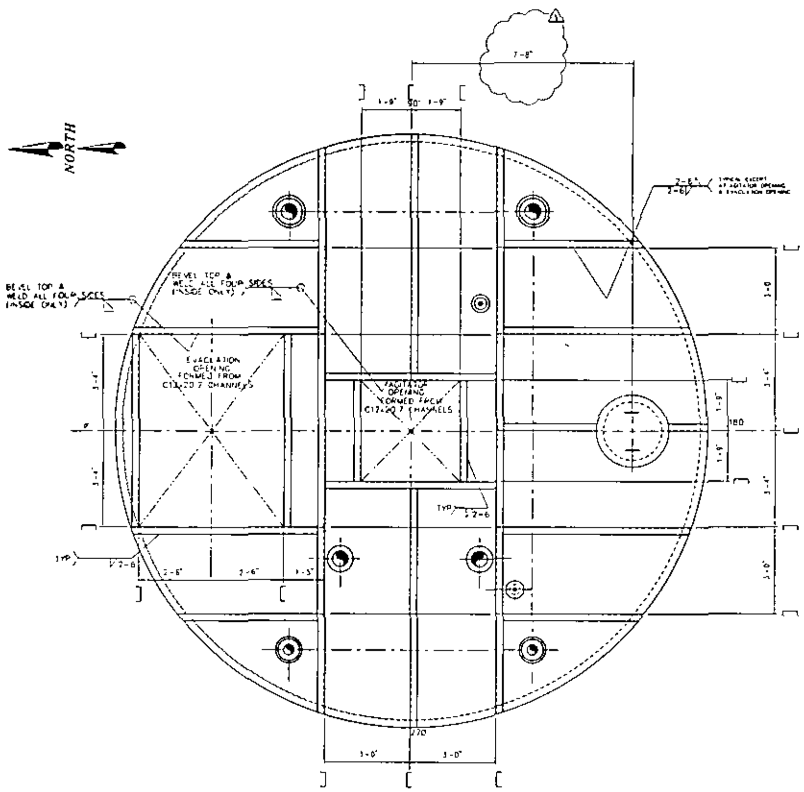
CARGILL FERTILIZER, INC.

#6 GRANULATION PLANT
REACTOR SECTIONS & DETAILS
ITEM NO. 37-2310

MECHANICAL

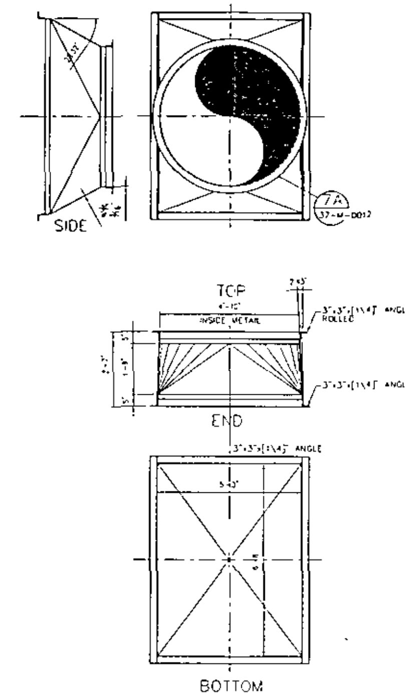
37 M-0013 1

M-0019 1



TANK TOP SUPPORT STEEL

1. ALL CHANNELS ARE C12x20.7 316LSS



DETAIL-VENT 7 37-M-0012

NO	DATE	REVISION	BY	CH	APP
1	6-27-03	ADD DIMENSION	MB		RAH
0	06-26-03	FOR ERECTION BID	GD	EC	RAH
0	4-30-2003	ISSUED FOR CONSTRUCTION	GD	BH	BH
PA	4-7-2003	REVISED BID	GD	BH	BH
A	3-25-2003	ISSUED FOR APPROVAL & BID	GD	BH	BH

REFERENCE DRAWINGS

CARGILL FERTILIZER, INC.

#6 GRANULATION PLANT
REACTOR TANK TOP STRUCTURAL SUPPORT DETAIL
ITEM NO. 37-2310

DISCIPLINE: MECHANICAL | PROJECT: 200202

37 M-0019 1

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

November 14, 2003

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. E. O. Morris, Vice President
Environment, Health and Safety
Cargill Fertilizer, Inc.
8813 Highway 41 South
Riverview, Florida 33569

Re: DEP File No. 0570008-044-AC; PSD-FL-336
No. 6 Granulation Plant - Riverview

Dear Mr. Morris:

The Department has received the application on October 17, 2003, for the modification of the No. 6 Granulation Plant in Riverview, Hillsborough County. Based on our initial review of the proposed project, we have determined that additional information is needed in order to continue processing this application package. In addition to the information we requested by letter dated on November 5, please submit the information requested below to the Department's Bureau of Air Regulation:

1. It appears there is a discrepancy in the proposed production rate increase for the AP Plant of 4000 TPD vs 4478 TPD. Which one is correct?
2. What is the capacity of the new Pipe Reactor and the new reactor that will replace Reactor Nos. 1 & 2? Submit design drawings and specifications of all the proposed new equipment.
3. Please explain in details the mode of operation of this plant and the different processes (i.e.: GTSP, AP, and the phosphates fertilizers with added nitrogen, sulfur and micronutrients)?
4. Your application states that the fluoride (F) emissions from the No.2 and No.4 building will not be increased since they stored GTSP and this production rate is not increased by this project. Since the AP production rate will increase, would it be any increase of F in the building as a result of storing AP? (Refer to Sections 2.2.5 and 2.22.7 of the PSD report)
5. Since the facility expansion permitted in 2001 has not been completed, recalculate Table 3-3 of the application using actual emission data for the last 2 years of operation. The GTSP plant and the other affected units are existing emission units that have been operating for several years. Therefore, actual emissions data should be used in this calculation.
6. Are the potential F emissions as a result of this modification 15.04 TPY or 22.46 TPY? It appears that the GTSP emissions (7.42 TPY) are not counted (Refer to Page 19 – Section G of the application and Table 3-3 of the PSD report). Please explain.

7. Are the potential PM/PM_{10} emissions as a result of this modification 19.82/19.58 or 84.20 TPY? It appears that the total GTSP and AP emissions (56.39 + 27.81 TPY) are not counted (Refer to Page 19 – Section G of the application and Table 3-3 of the PSD report). Please explain.

8. Your application states that the GTSP Plant is not subject to the NSPS, Subpart W requirements due to this modification (Page 3-11). Please explain.

9. Please re do any significant impact area modeling due to emissions changes as a result of recalculations required by comment number 5 above. Also update Table 6-3 to reflect the use of actual emissions. If the significant impact area changes for PM_{10}, then further applicable AAQS and increment modeling should be done. If current versus future fluoride impacts change, these changes should be updated in Tables 6-16 and 6-17. If pollutant applicability changes and other pollutants are subject to PSD, then all required modeling associated with those pollutants should be performed. In addition, if the emission changes impact the regional haze analysis, it needs to be updated.

Any additional comments from EPA and the U.S. Fish and Wildlife Service will be forwarded to you after we receive them.

The Department will resume processing this application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. A new certification statement by the authorized representative or responsible official must accompany any material changes to the application. Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days.

We will be happy to meet and discuss the details with you or your staff. If you have any questions regarding this matter, you can call me at 850/921-9523.

Sincerely,

A.A. Linero, P.E. Administrator
New Source Review Section

AAL/th

cc: J. Little, EPA
J. Bunyak, NPS
G. Kissel, DEP-SWD
A. Harmon, HCEPC
D. Buff, P.E., Golder Associates, Inc.

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. E.O. Morris
Vice President
Environment, Health and Safety
Cargill Fertilizer, Inc.
8813 Highway 41 South
Riverview, FL 33569

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* B. Date of Delivery

C. Signature

X

☐ Agent
☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
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☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
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PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

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E. O. Morris
Street, Apt. No.; or PO Box No.
8813 Highway 41 South
City, State, ZIP+ 4
Riverview, FL 33569

PS Form 3800, May 2000 See Reverse for Instructions