

US EPA ARCHIVE DOCUMENT

Section P - Master List

Area ID	Cert. ID	Figures	Comments
*Signifies document has been stamped by a Professional Engineer			
Containment Areas			
Cont. A and B	Tankfarm A	Cert. Report*, S1*, C-101*	
	Tankfarm B	Cert. Report*, S1*, C-101*	
Cont. C and D	Tankfarm C	Cert. Report*, liner installation photos, P103-1*, P103-2*	
	Tankfarm D	Cert. Report*, liner installation photos, P103-1*, P103-2*	
Cont. E, F, and G	Tankfarm E	Cert. Report*	
	Tankfarm F	Cert. Report*	
	Tankfarm G	Cert. Report*	
Buildings			
Bldg. 1	Drum Storage Building #	Cert. Report*, D-2, D-3, Table D-1, DSB-101 (1 of 2)*, and DSB (2 of 2)*	
Bldg. 2	Drum Storage Building #	Cert. Report*, D-4, D-5, Table D-1, A-2, and A-3	
Process Units			
Vaccum Pot	Vacuum Pot	Cert. Report*, E-2, E-4	
	S-1	Cert. Report*, E-2, E-4	
	S-2	Cert. Report*, E-2, E-4	
Thin Film Evaporator	Thin Film Evaporator Area	Cert. Report*, E-2, E-5	
	Thin Film Evaporator Flush Tank	Cert. Report*, E-2, E-5	
	Thin Film Evaporator Receiver	Cert. Report*, E-2, E-5	
	Reboiler	Cert. Report*, E-2, E-3	
Column 30	Separator	Cert. Report*, E-2, E-3	
Tanks			
TK-101	Tank T-101	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-6	
TK-102	Tank T-102	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-6	
TK-103	Tank T-103	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-6	
TK-104	Tank T-104	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-6	
TK-105	Tank T-105	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-6	
TK-112	Tank T-112	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-6	
TK-113	Tank T-113	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-7	
TK-121	Tank T-121	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-7	
TK-122	Tank T-122	Fig D-7	
TK-123	Tank T-123	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-7	
TK-124	Tank T-124	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-7	
TK-132	Tank T-132	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig D-9*	T-132 becomes proposed T-401 for permit
TK-136	Tank T-136	Cert. Report*, Design Load/Seismic & Wind Analysis/ Check support column, base plate and anchor bolts*, Fig-10*	T-136 becomes proposed T-301 for permit
TK-108 and TK-109		Tank 108 and 109 cut sheet; Fig D-8*	PE stamped as 30% design drawing
TK-137 and TK-138		Tank 137 and 138 cut sheet; Fig D-8*	PE stamped as 30% design drawing
TK-401, 402, and 403		Tank 401 to 403 cut sheet; Fig D-9*	PE stamped as 30% design drawing
TK-411, 412, and 413		Tank 411 to 413 cut sheet; Fig D-9*	PE stamped as 30% design drawing
TK-301, 302, and 303		Tank 301 to 303 cut sheet; Fig D-10*	PE stamped as 30% design drawing
TK-311, 312, and 313		Tank 311 to 313 cut sheet; Fig D-10*	PE stamped as 30% design drawing

TK-321, 322, and 323		Tank 321 to 323 cut sheet; Fig D-10*	PE stamped as 30% design drawing
TK-304, 305, 306, and 307		Tanks 304 to 307 cut sheet; Fig D-11*	PE stamped as 30% design drawing
TK-308 and 309		Tank 308 and 309 cut sheet; Fig D-11*	PE stamped as 30% design drawing
TK-511 and 512		Tank 511 and 512 cut sheet; Fig D-11*	PE stamped as 30% design drawing

* Signifies document has been stamped by a Professional Engineer

Container Storage Area Certification
Drum Storage Building #1

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005, in accordance with 40 CFR Section 264.175, "Containment", Metro Environmental Services, Inc. performed an assessment of Drum Storage Building #1 at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

Containment Area Base

Drum Storage Building #1 is constructed of 6-inch thick, 3,750-psi concrete with one mat of #5 rebar placed at 18" spacing on center in both directions. A polyethylene liner was installed under the entire building during construction. Chemical resistant waterstops were installed at cold joints in the slab.

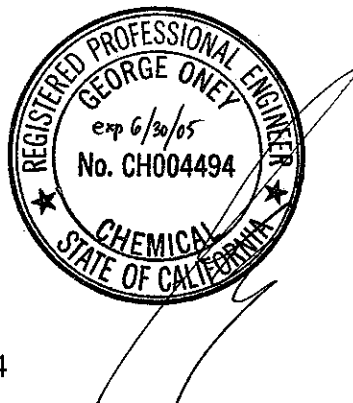
Containment Volume

The total containment volume available for Drum Storage Building #1 is 41,078 gallons. The required containment volume is 12,144 gallons. See the attached containment volume calculations for details.

CERTIFICATION

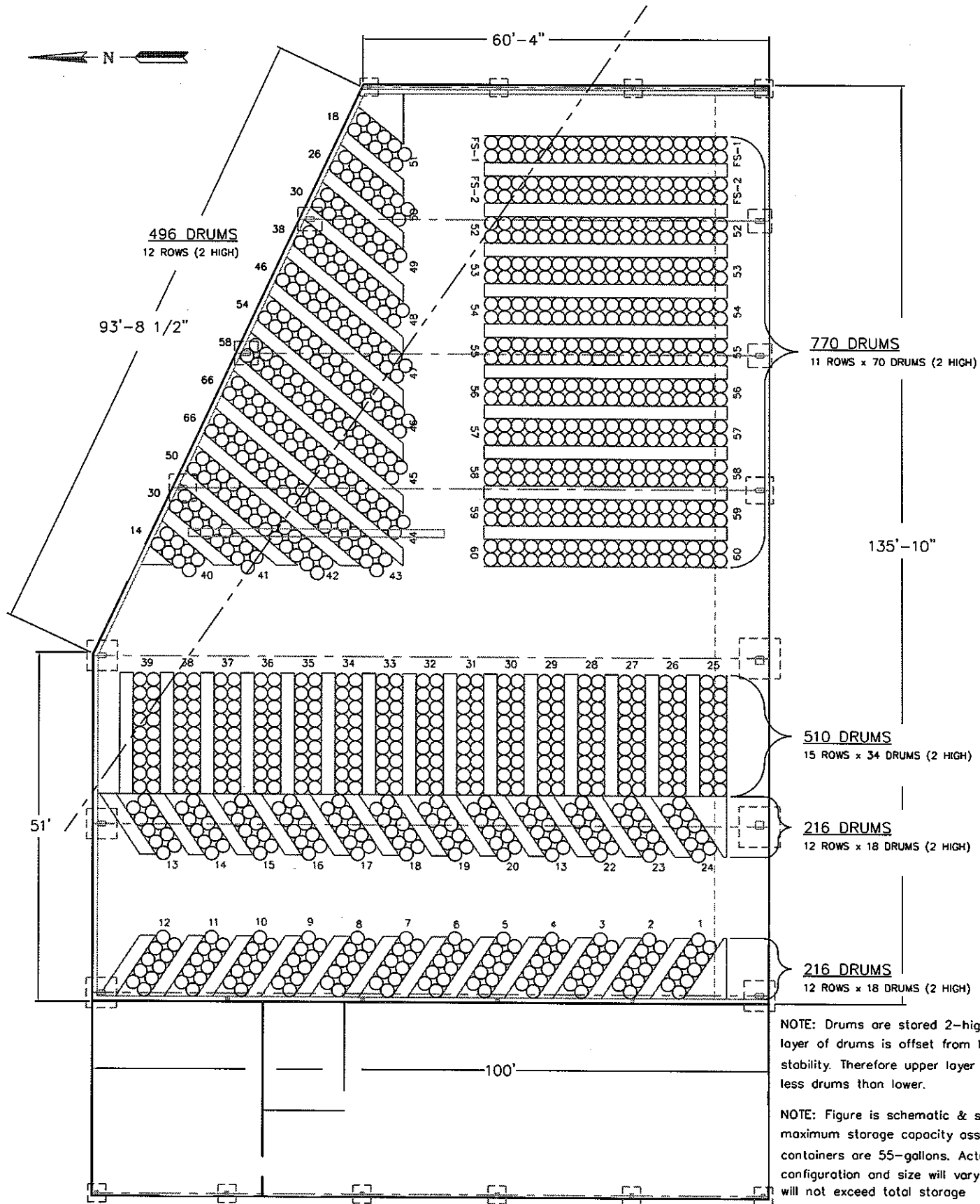
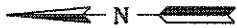
I hereby certify that this containment system is suitably designed to achieve the requirements of 40 CFR 264.175.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

50 Foot Setback From Property Boundary



REV	DATE	REVISION	APP
2	10/04	Change rows to PS-1, PS-8	NT
1	3/04	Various revisions	NT
DRAWN BY: ROBERT T. PRONATTI			



ROMIC
ENVIRONMENTAL TECHNOLOGIES
ENGINEERING DEPARTMENT

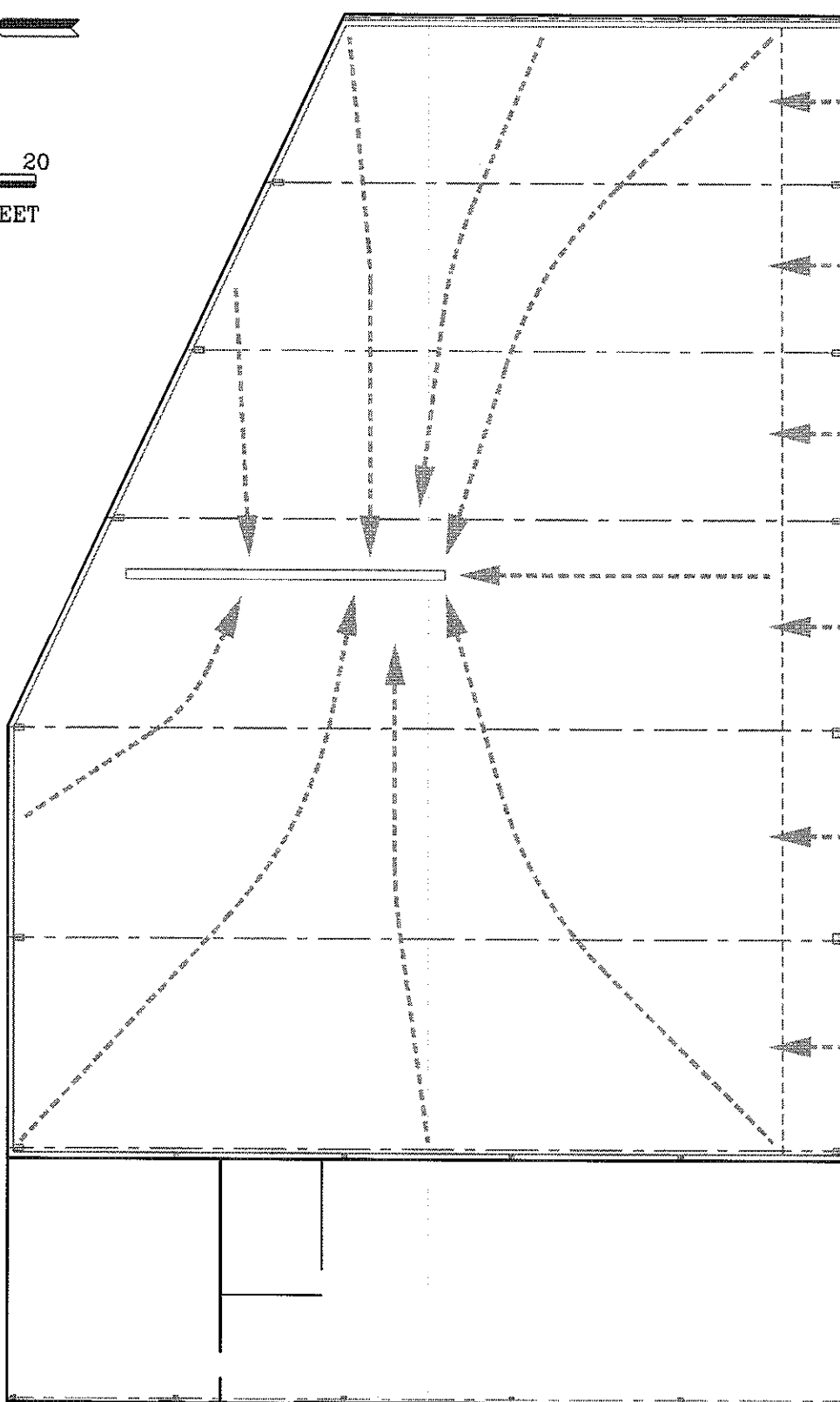
ROMIC - SOUTHWEST
CHANDLER, ARIZONA
DRUM STORAGE
BUILDING 1

DATE: 12-05-02
SCALE: NONE

D-2



0 10 20
SCALE IN FEET



I:\rsw_partb_04_final\drumstorage\fig_d3

1		4/04		Updated border		RP	
REV	DATE	REVISION		APP		DATE: 12-05-02	
DRAWN BY: ROBERT T. PIONATTI				SCALE: NONE			
 ROMIC ENVIRONMENTAL TECHNOLOGIES ENGINEERING DEPARTMENT						ROMIC - SOUTHWEST CHANDLER, ARIZONA DRAINAGE IN STORAGE BUILDING #1	
						D-3	

TAE D-1
SECONDARY CONTAINMENT CALCULATIONS FOR CONTAINER STORAGE AREAS

STORAGE/PROCESS AREA	Length (ft)	Width (ft)	Containment Area (ft ²)	Min Depth (in)	Max Depth (in)	# Drums on Floor	# Drums Stacked	Total Drums	Gallons Equivalent	Containment Required (gal) (10% of quantity stored)	Containment Required (ft ³) (7.48 gal/ft ³)	Gross Containment (ft ³)	Displacement from Drums (ft ³)	Net Available Containment (ft ³)
CONTAINER STORAGE BUILDING #1														
Rows 1-39	51	100	5100.0	8	8	510	432	942	51810			3400.0	1068.1	
Rows 40-51	84.83	39.67	1682.5	8	8	260	236	496	27280			1121.7	544.5	
Rows 52-62	84.83	60.33	5118.3	8	8	396	374	770	42350			3412.2	829.4	
						1166	1042	2208	121440	12144	1623.5	7933.9	2442.1	5491.8
CONTAINER STORAGE BUILDING #2														
Bay 1 - Rows 80-81	26.833	14.17	380.1	2	8	52	48	100	5500			158.4	68.1	
Bay 2 - Rows 82-83	26.833	14.17	380.1	2	8	52	48	100	5500			158.4	68.1	
Bay 3 - Rows 84-85	26.833	14.17	380.1	2	8	52	48	100	5500			158.4	68.1	
Bay 4 - Rows 86-87	26.833	14.17	380.1	2	8	52	48	100	5500			158.4	68.1	
Bay 5 - Rows 88-89	26.833	14.17	380.1	2	8	52	48	100	5500			158.4	68.1	
Bay 6 - Rows 90-91	26.833	14.17	380.1	2	8	52	48	100	5500			158.4	68.1	
Bay 7 - Rows 92-93	26.833	14.17	380.1	2	8	52	48	100	5500			158.4	68.1	
Bay 8 - Rows 94-95	26.833	14.17	380.1	2	8	52	48	100	5500			158.4	68.1	
Bay 9 - Rows 96-97	26.833	14.17	380.1	2	8	52	48	100	5500			158.4	68.1	
Bay 10 - Rows 98-99	26.833	14.17	380.1	2	8	52	48	100	5500			158.4	68.1	
						520	480	1000	55000	5500	735.3	1583.9	680.7	903.2

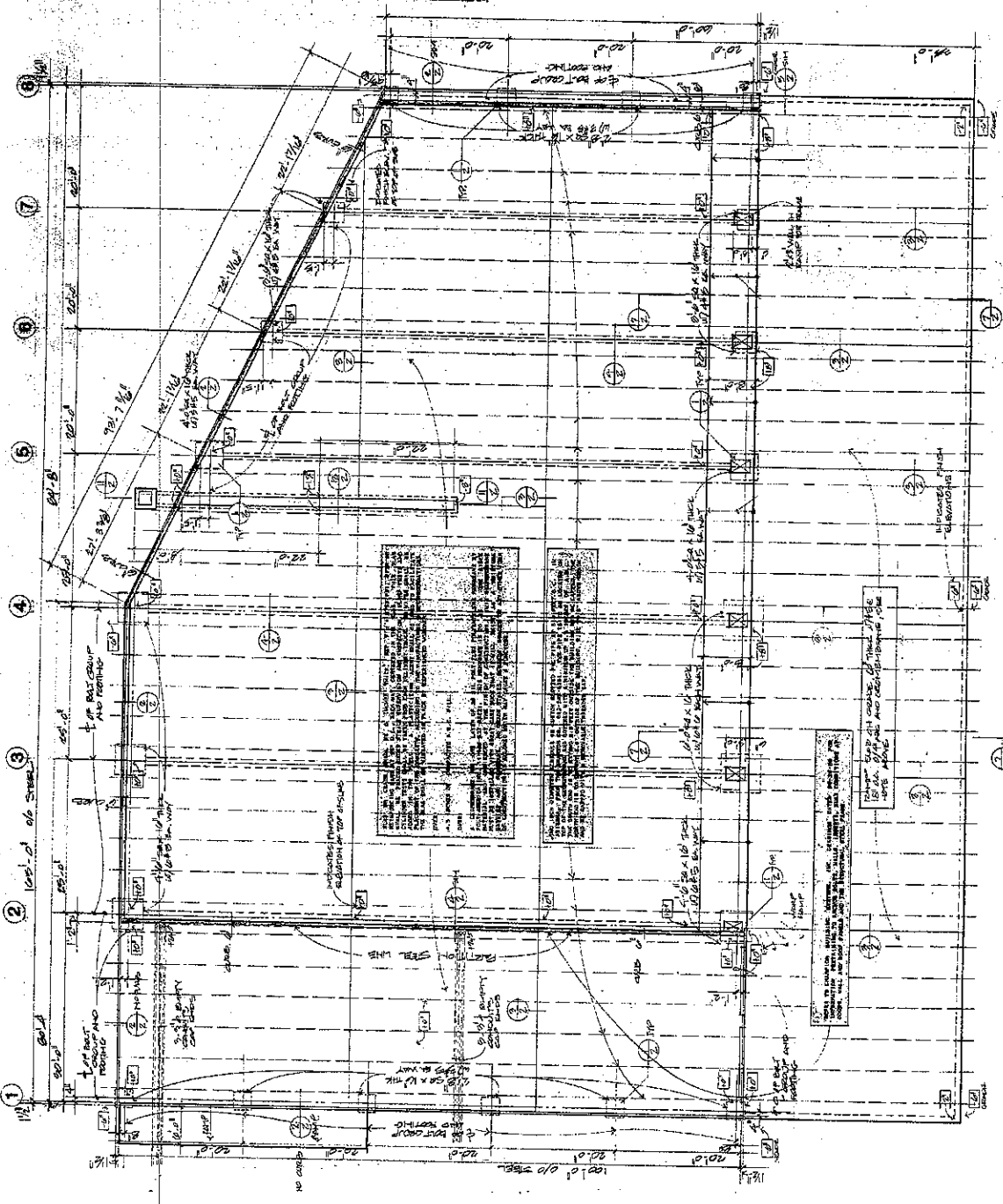
Notes:

Calculations assume maximum storage capacity assuming all container are 55-gallons drums (see Figure D-2). Various types of containers (e.g., tri-wall boxes, intermediate bulk containers, or "totes," 5-gallon cans) may be stored in these buildings.

Displacement from drums is the secondary containment space taken up by drums sitting in containment. Displacement calculated using formula: $\pi r^2 h$, where r is the radius of a drum (one foot), and h is the height of the berm.

Secondary containment capacity is deemed adequate if the Net Available Containment is greater than the Containment Required.

Containment capacity for bays in Building 2 calculated by multiplying surface area of bay by average depth (i.e., 5").

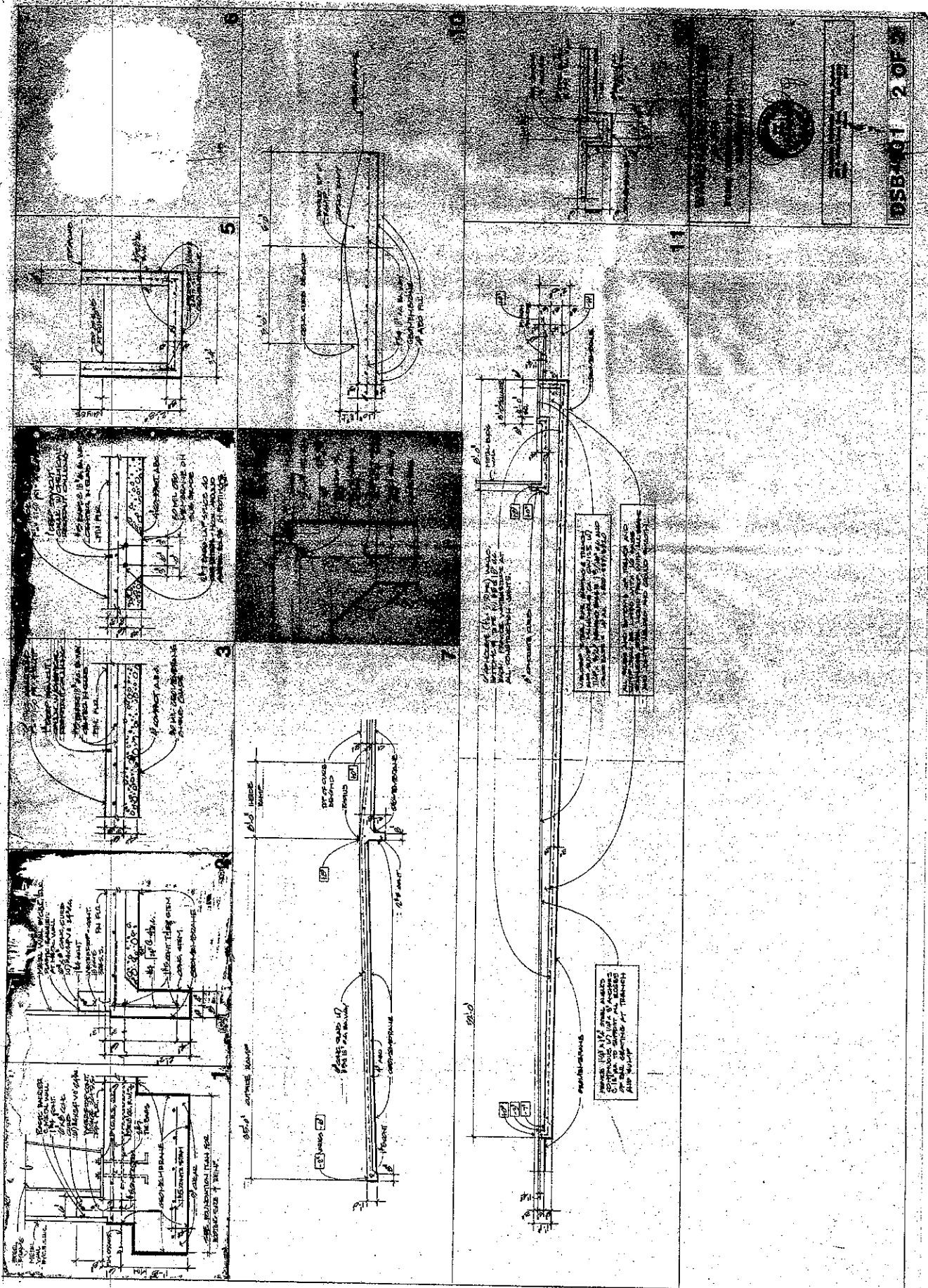


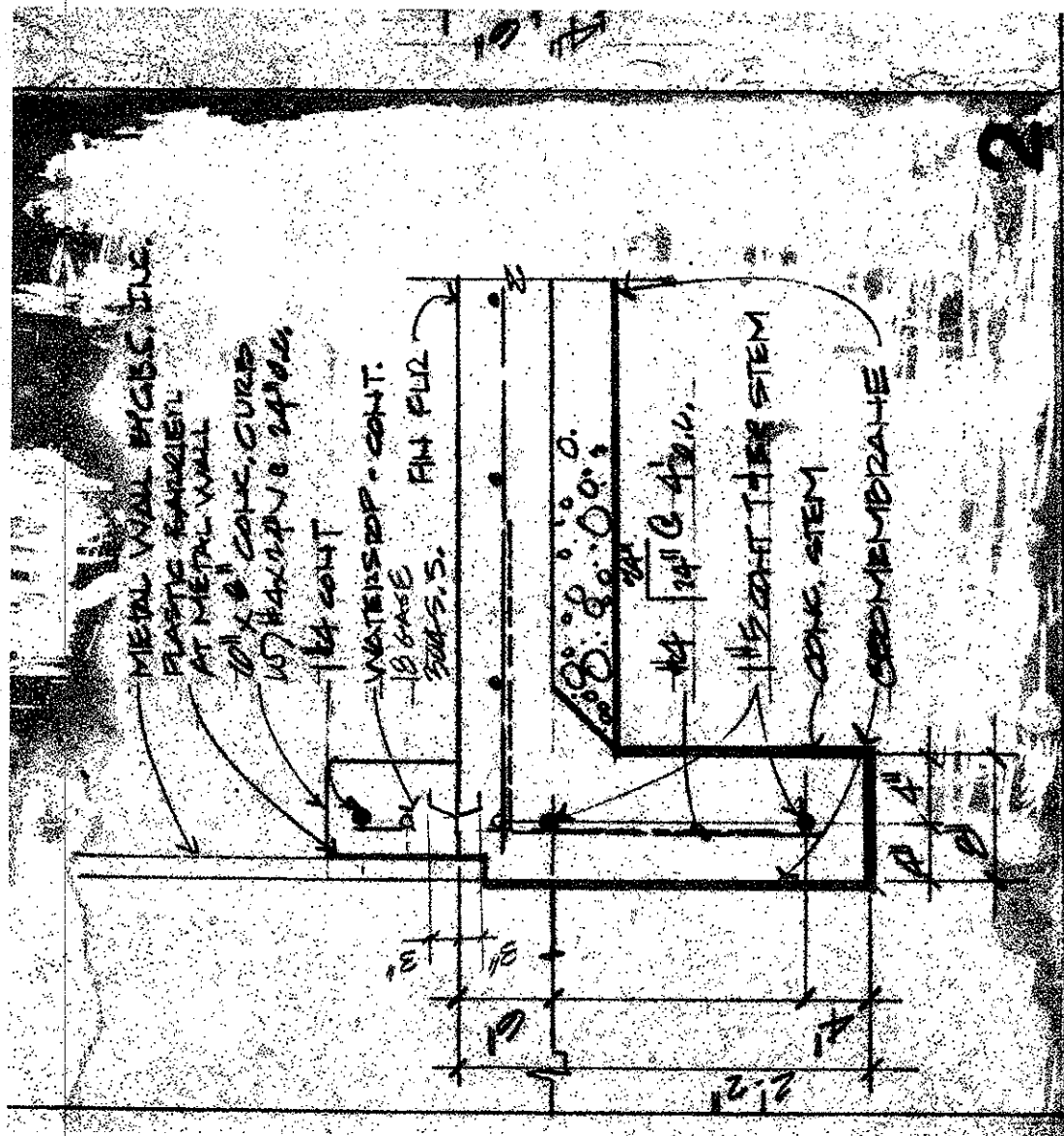
FOUNDATION PLAN 1/8" = 1'-0"

DRUM STORAGE BUILDING
 FOUNDATION PLAN
 1/8" = 1'-0"



DSB-101 1 OF 2





Container Storage Area Certification

Drum Storage Building #2

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, in accordance with 40 CFR Section 264.175, "Containment", Metro Environmental Services, Inc. performed an assessment of Drum Storage Building #2 at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

Containment Area Base

Drum Storage Building #2 is constructed of 6-inch thick concrete with one mat of #5 rebar placed at 12" spacing on center in both directions. A polyethylene liner was installed under the entire building during construction. Chemical resistant waterstops were installed at cold joints in the slab.

Containment Volume

The total containment volume available for Drum Storage Building #2 is 6,755 gallons. The required containment volume is 5,500 gallons. See the attached containment volume calculations for details.

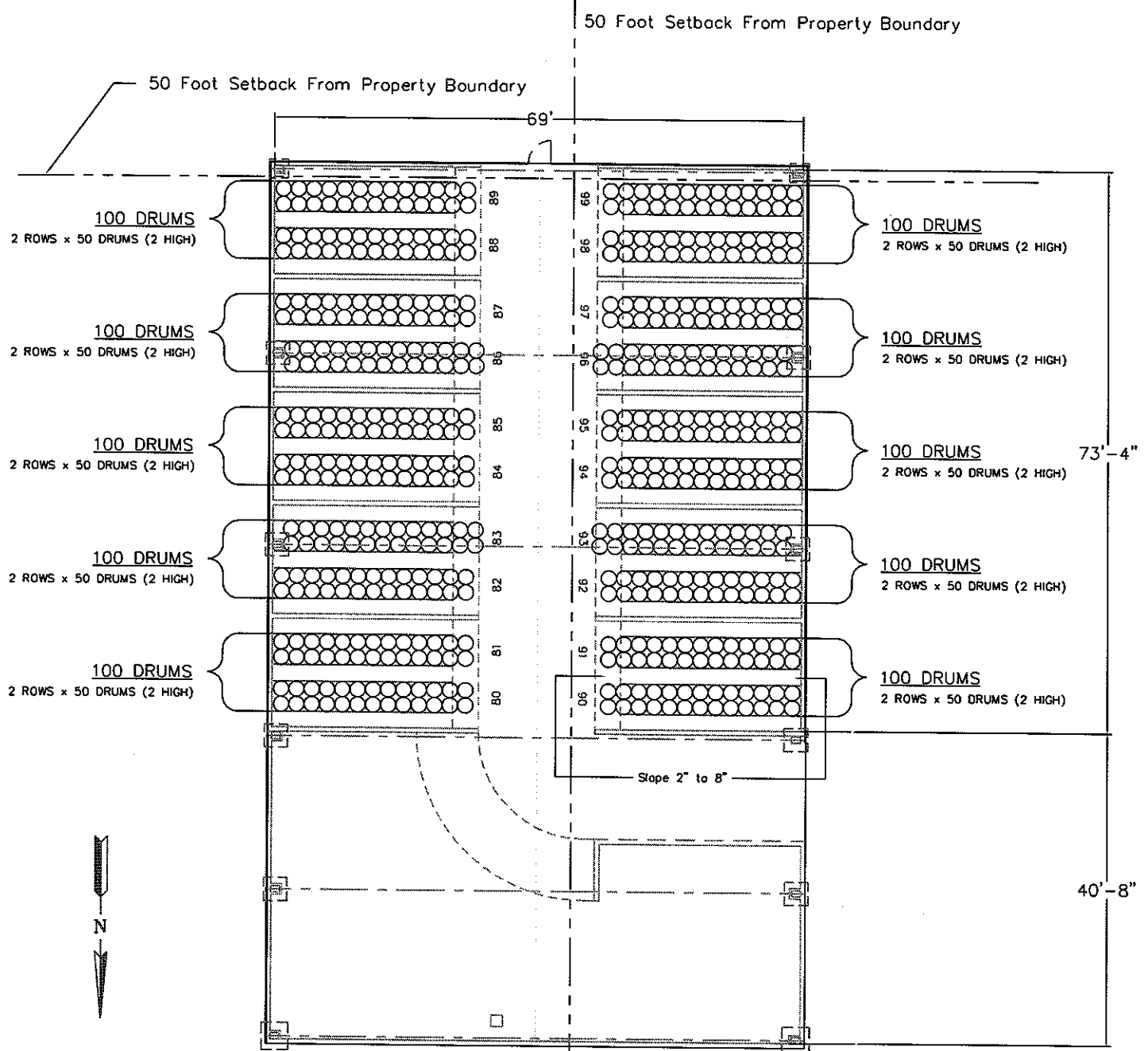
CERTIFICATION

I hereby certify that this containment system is suitably designed to achieve the requirements of 40 CFR 264.175.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494



NOTE: Drums are stored 2-high. Upper layer of drums is offset from lower for stability. Therefore upper layer has two less drums than lower.

NOTE: Figure is schematic & shows maximum storage capacity assuming all containers are 55-gallons. Actual configuration and size will vary but will not exceed total storage capacity.

REV	DATE	REVISION	APP
1	9/04	Various revisions	NT
DRAWN BY: ROBERT T. PIGNATTI			



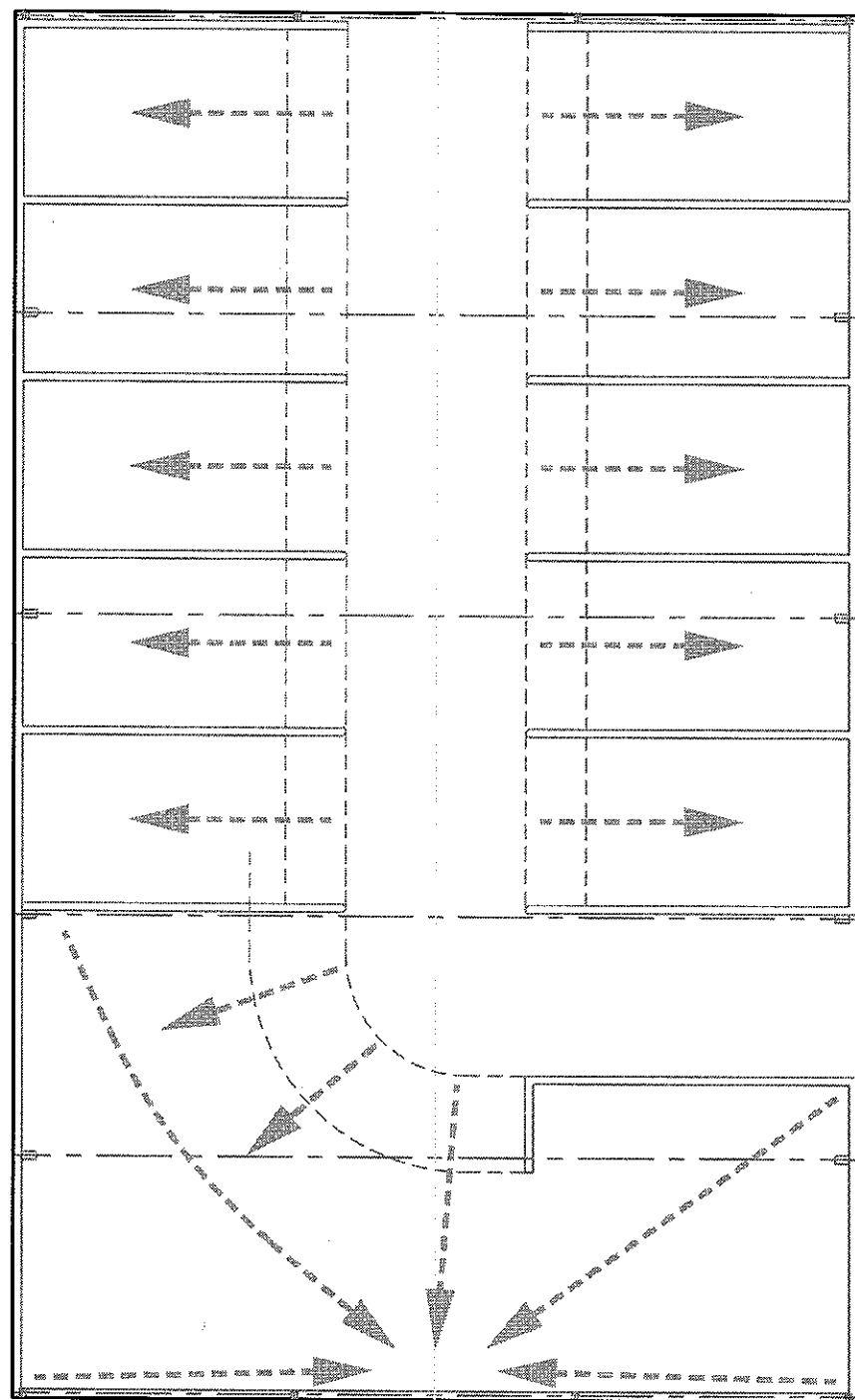
ROMIC - SOUTHWEST
CHANDLER, ARIZONA
DRUM STORAGE
BUILDING 2

DATE: 12-05-02
SCALE: NONE

D-4



0 10 20
SCALE IN FEET



I:\rsw_portb_04_final\drumstorage\fig_D5

1		4/04	Updated titleblock	WK
REV	DATE	REVISION	APP	
DRAWN BY: ROBERT T. PIONATTI				
ROMIC - SOUTHWEST CHANDLER, ARIZONA			DATE: 12-05-02 SCALE: NONE	
DRAINAGE IN STORAGE BUILDING #2			D-5	

SECONDARY CONTAINMENT CALCULATIONS FOR CONTAINER STORAGE AREAS

STORAGE/PROCESS AREA		Length (ft)	Width (ft)	Containment Area (ft ²)	Min Depth (in)	Max Depth (in)	# Drums on Floor	# Drums Stacked	Total Drums	Gallons Equivalent	Containment Required (gal) (10% of quantity stored)	Containment Required (ft ³) (7.48 gal/ft ³)	Gross Containment (ft ³)	Displacement from Drums (ft ³)	Net Available Containment (ft ³)
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							1166	1042	2208	121440	12144	1623.5	7933.9	2442.1	5491.8
CONTAINER STORAGE BUILDING #2															
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Bay 2 - Rows 82-83	26.833	14.17	380.1	2	8	52	48	100	5500				158.4	68.1	
Bay 3 - Rows 84-85	26.833	14.17	380.1	2	8	52	48	100	5500				158.4	68.1	
Bay 4 - Rows 86-87	26.833	14.17	380.1	2	8	52	48	100	5500				158.4	68.1	
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Bay 6 - Rows 90-91	26.833	14.17	380.1	2	8	52	48	100	5500				158.4	68.1	
Bay 7 - Rows 92-93	26.833	14.17	380.1	2	8	52	48	100	5500				158.4	68.1	
Bay 8 - Rows 94-95	26.833	14.17	380.1	2	8	52	48	100	5500				158.4	68.1	
Bay 9 - Rows 96-97	26.833	14.17	380.1	2	8	52	48	100	5500				158.4	68.1	
Bay 10 - Rows 98-99	26.833	14.17	380.1	2	8	52	48	100	5500				158.4	68.1	
							520	480	1000	55000	5500	735.3	1583.9	680.7	903.2

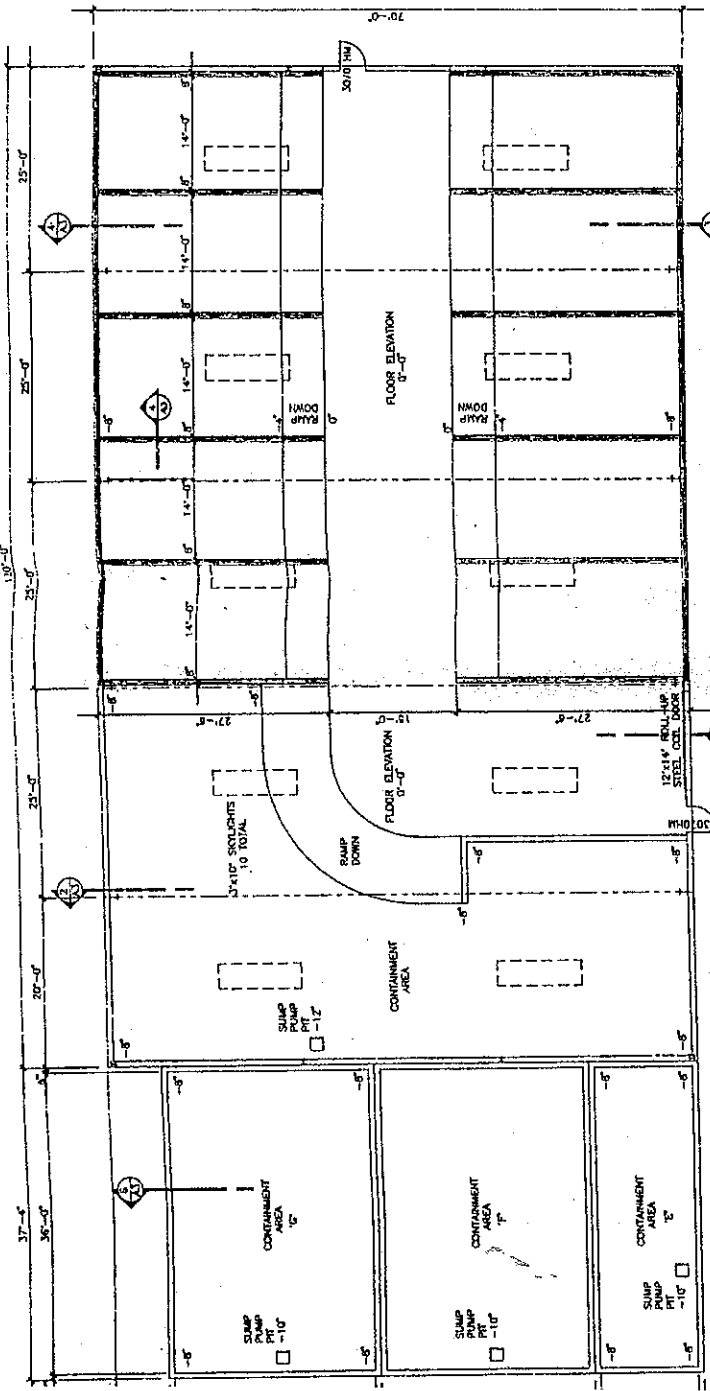
Notes:

Calculations assume maximum storage capacity assuming all container are 55-gallons drums (see Figure D-2). Various types of containers (e.g., tri-wall boxes, intermediate bulk containers, or "totes," 5-gallon cans) may be stored in these buildings.

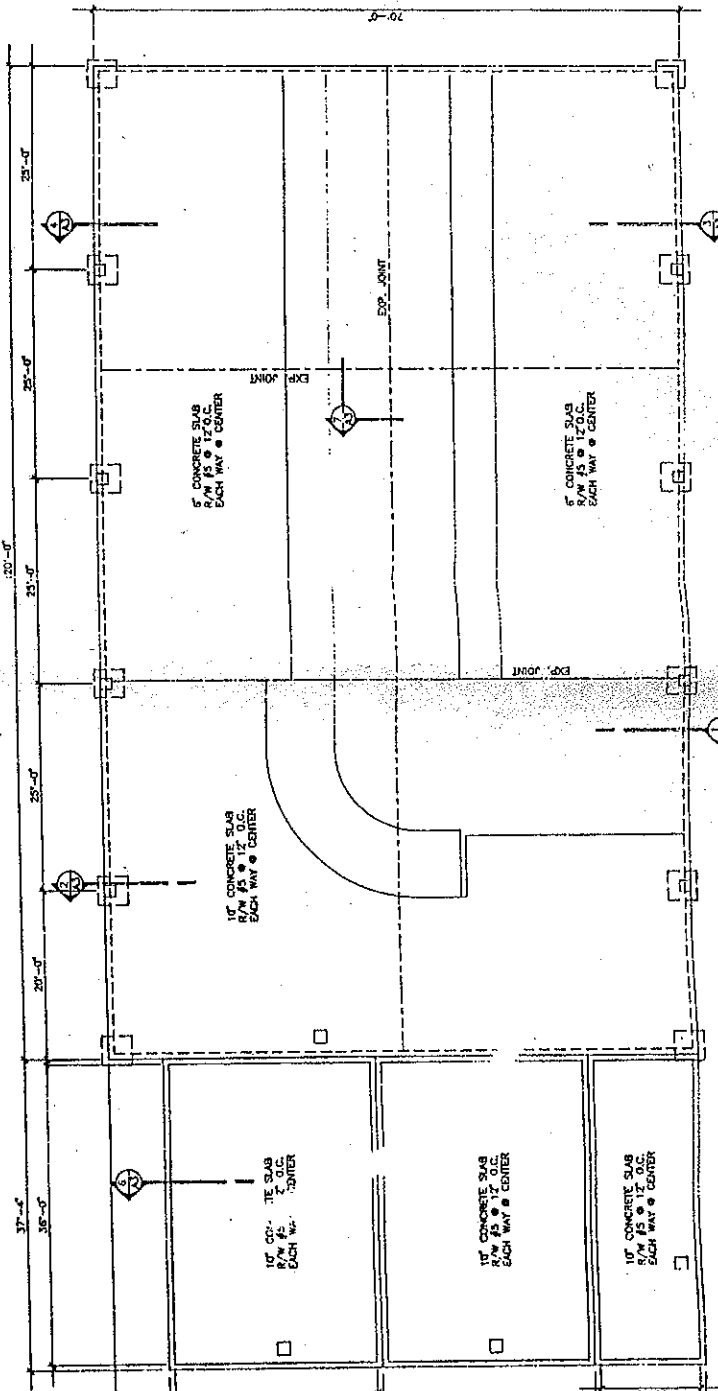
Displacement from drums is the secondary containment space taken up by drums sitting in containment. Displacement calculated using formula: $\pi r^2 h$, where r is the radius of a drum (one foot), and h is the height of the berm.

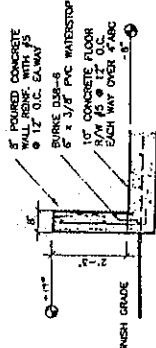
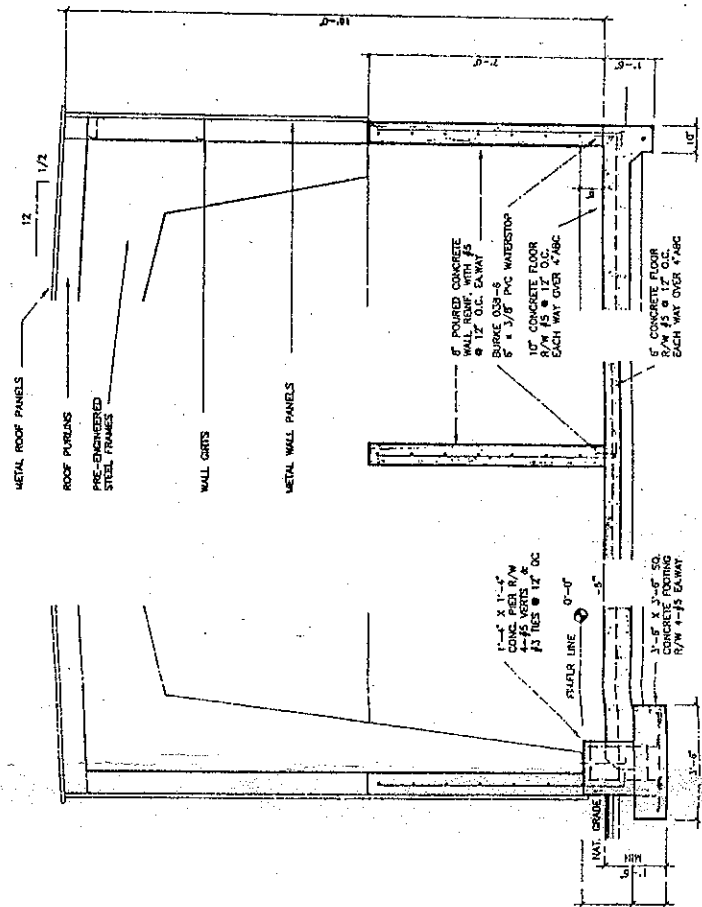
Secondary containment capacity is deemed adequate if the Net Available Containment is greater than the Containment Required. Containment capacity for bays in Building 2 calculated by multiplying surface area of bay by average depth (i.e., 5").

FLOOR PLAN
SCALE: 1/8" = 1'-0"



FOUNDATION PLAN
SCALE: 1/8" = 1'-0"





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(3)

2

Process Area Certification

Thin Film Evaporator Area

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, Metro Environmental Services, Inc. performed an assessment of the Thin Film Evaporator Area at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

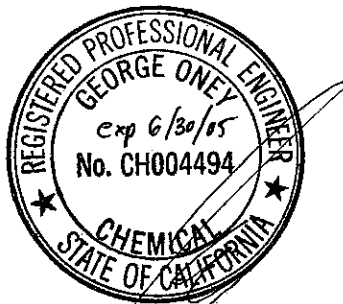
Containment Area Base

The Thin Film Evaporator Area is constructed of 10-inch thick, minimum 3,000-psi concrete with two mats of #5 rebar placed at 12" spacing on center each way. A polyethylene liner was installed under the containment area during construction.

CERTIFICATION

Based upon my professional expertise and judgement this containment system has been properly designed and installed to achieve the requirements of 40 CFR 264.193.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Certification Report
Thin Film Evaporator Flush Tank

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of the Thin Film Evaporator Flush Tank, a 225-gallon hazardous waste processing tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to process hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 225-gallon tank, (Flush Tank), is constructed of stainless steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of stainless steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests upon a support structure that rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located inside of a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

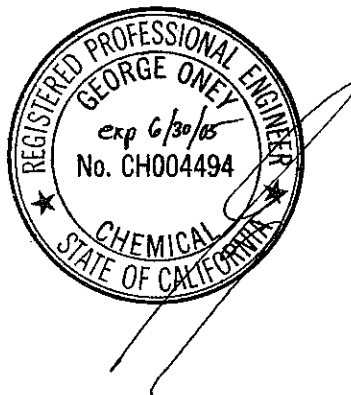
Estimated Remaining Service Life

The tank was installed in 1991. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Certification Report
Thin Film Evaporator Receiver

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of the Thin Film Evaporator Receiver Tank, a 225-gallon hazardous waste processing tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to process hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 225-gallon tank, (Receiver Tank), is constructed of stainless steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of stainless steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests upon a support structure that rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located inside of a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

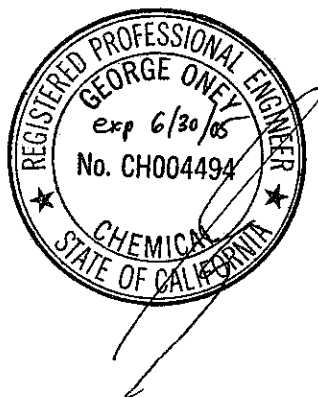
Estimated Remaining Service Life

The tank was installed in 1991. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

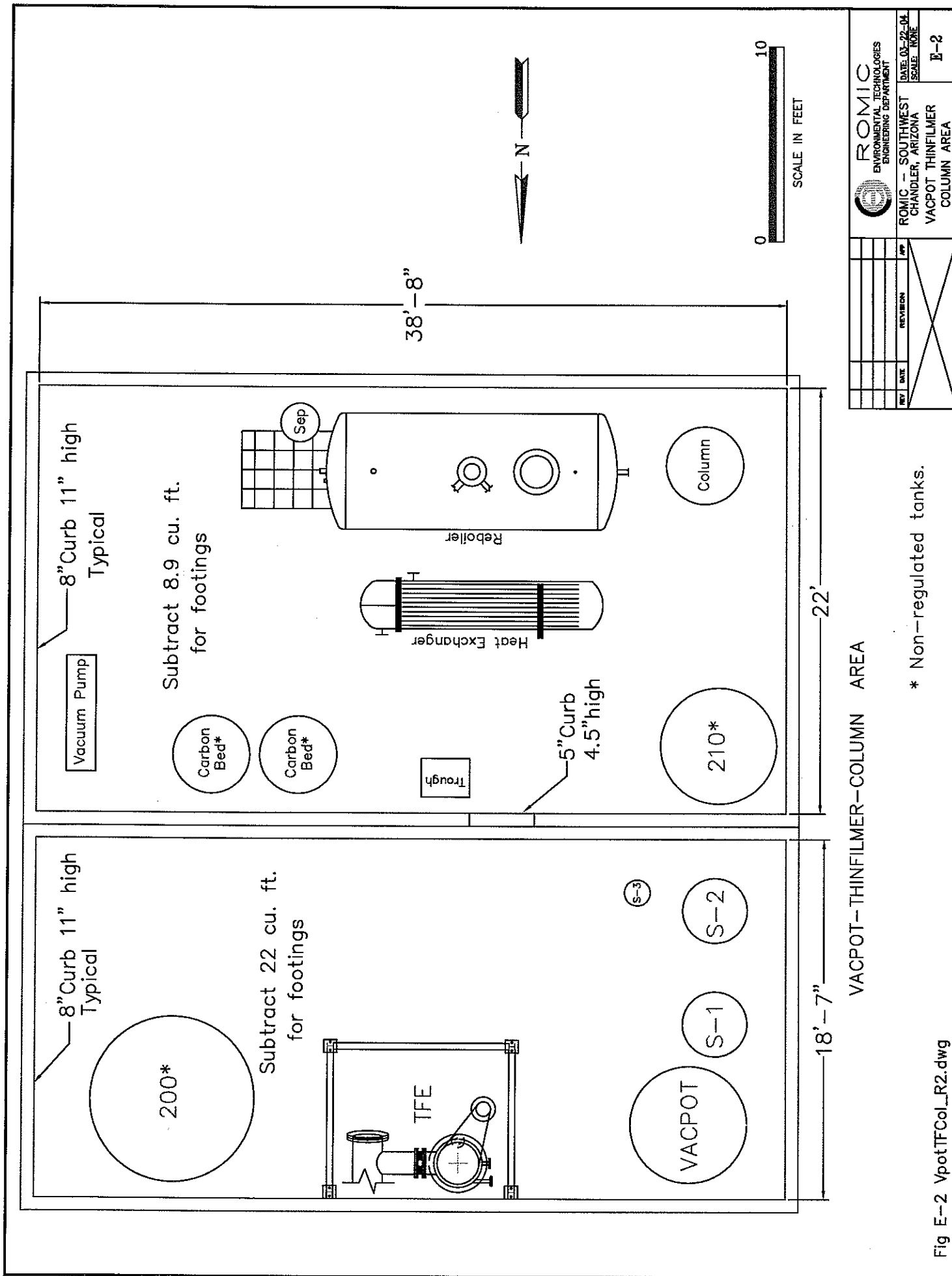
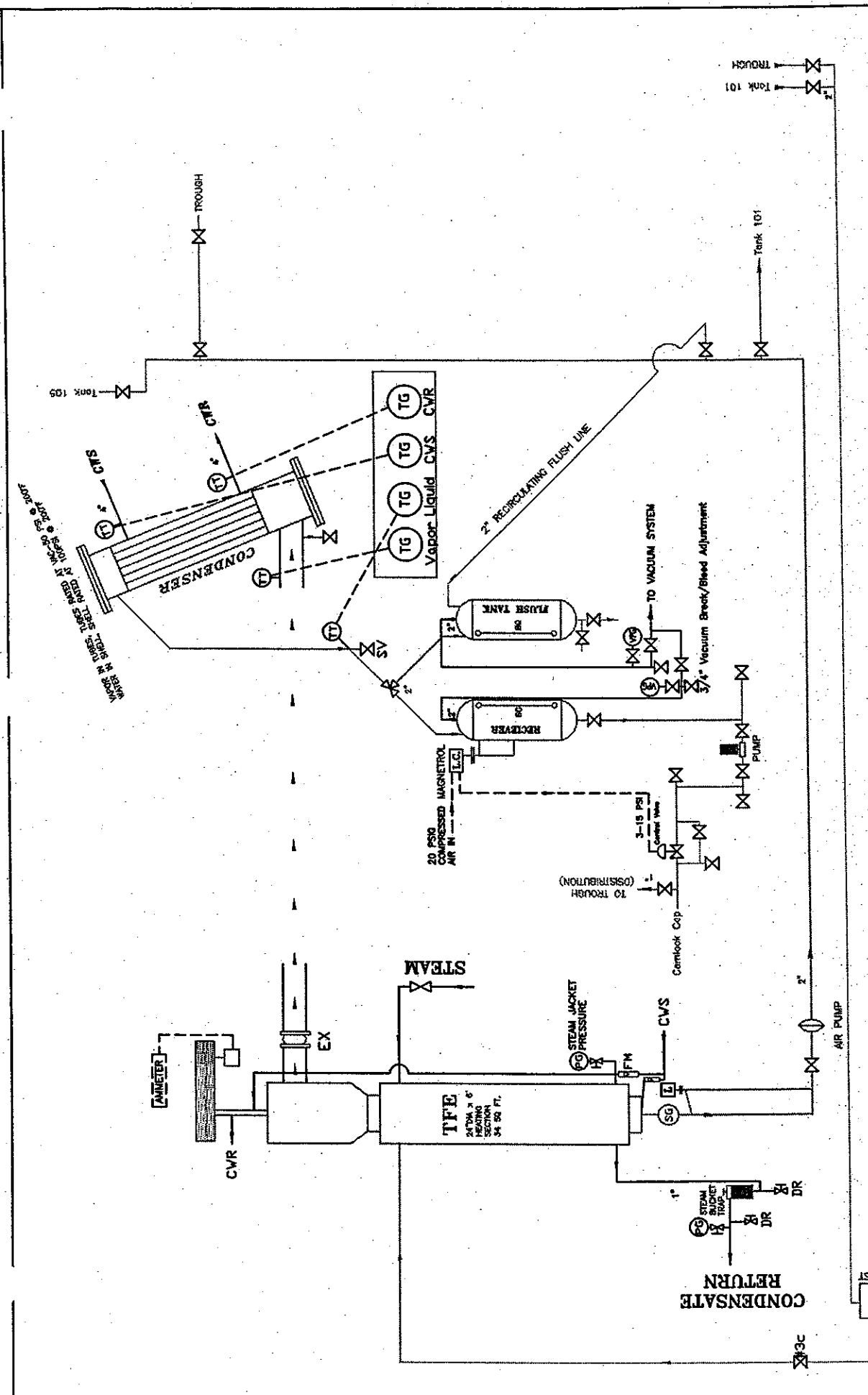


Fig E-2 VpotTFCol_R2.dwg



Note: Receiver and Flush Tank have ST at bottom of SG.

ROMIC
ENVIRONMENTAL TECHNOLOGIES
ENGINEERING DEPARTMENT

DATE: 07-11-03
SCALE: NONE

ROMIC - SOUTHWEST
CHANDLER, ARIZONA

THIN FILM EVAPORATOR
PROCESS FLOW DIAGRAM

REV	DATE	REVISION
1	5/04	General revisions

Tank Certification Report

Vacuum Pot

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of the Vacuum Pot, a 1,700-gallon hazardous waste processing tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to process hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 1,700-gallon tank, (Vacuum Pot), is constructed of stainless steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of stainless steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests upon a support structure that rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located inside of a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

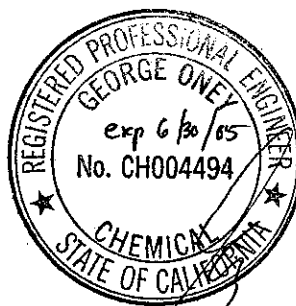
Estimated Remaining Service Life

The tank was installed in 1995. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Certification Report

S-1

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank S-1, a 600-gallon hazardous waste processing tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to process hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 600-gallon tank, (S-1), is constructed of stainless steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of stainless steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests upon a support structure that rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located inside of a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

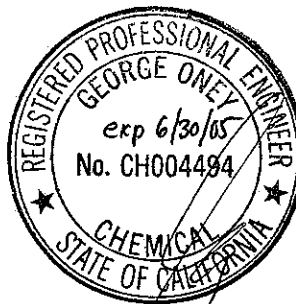
Estimated Remaining Service Life

The tank was installed in 1995. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Certification Report

S-2

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank S-2, a 600-gallon hazardous waste processing tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to process hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 600-gallon tank, (S-2), is constructed of stainless steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of stainless steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests upon a support structure that rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located inside of a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

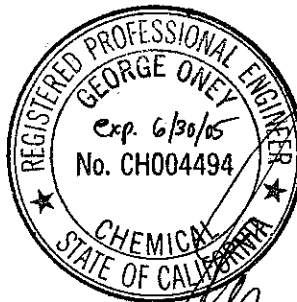
Estimated Remaining Service Life

The tank was installed in 1995. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

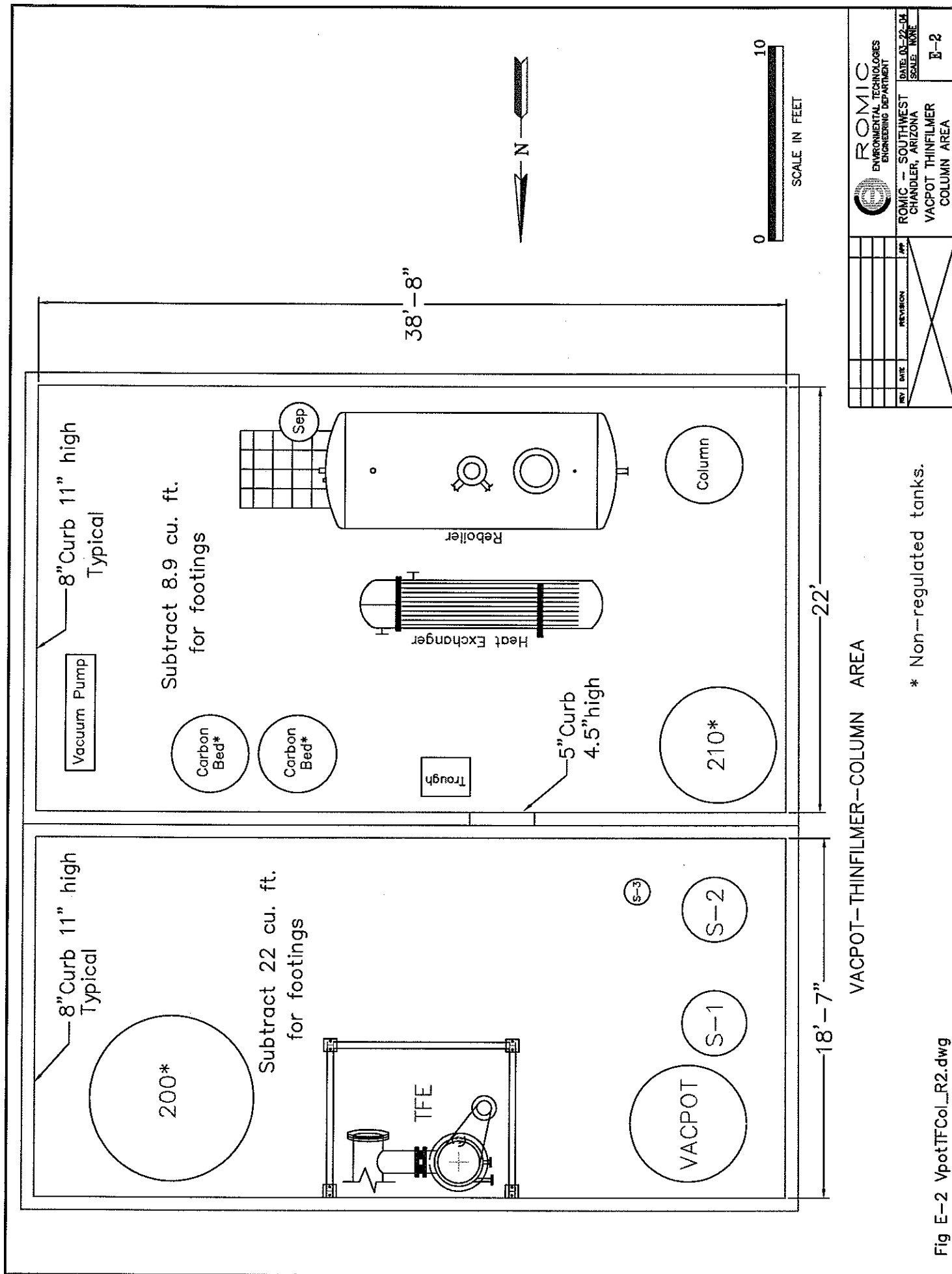
CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494



ROMIC
ENVIRONMENTAL TECHNOLOGIES
ENGINEERING DEPARTMENT

ROMIC - SOUTHWEST
CHANDLER, ARIZONA

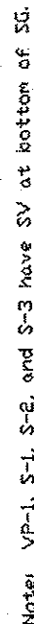
VACPOT THINFILMER
COLUMN AREA

REV	DATE	REVISION	APP

DATE: 03-22-04
SCALE: NONE
E-2

* Non-regulated tanks.

Fig E-2 VpotTFCol_R2.dwg



I:\RSW_partB_04_AnaI\B-4 revVP

[illegible]

Process Area Certification

Reboiler Area

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On May 27, 2005, Metro Environmental Services, Inc. performed an assessment of the Reboiler Area at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

Containment Area Base

The Reboiler Area is constructed of concrete and coated with a chemical resistant coating. The area was visually inspected for cracks or gaps in the containment. No obvious defects were noted during the inspection.

CERTIFICATION

Based upon my professional expertise and judgement this containment system has been properly designed and installed to achieve the requirements of 40 CFR 264.193.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494



Tank Certification Report

Reboiler

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of the Reboiler, a 2,990-gallon hazardous waste processing tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to process hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 2,990-gallon tank, (Reboiler), is constructed of stainless steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of stainless steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests upon a support structure that rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located inside of a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

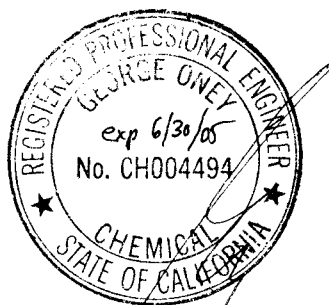
Estimated Remaining Service Life

The tank was installed in 2000. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Certification Report

Separator

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of the Separator Tank, an 85-gallon hazardous waste processing tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to process hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 85-gallon tank, (Separator Tank), is constructed of stainless steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of stainless steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests upon a support structure that rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located inside of a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

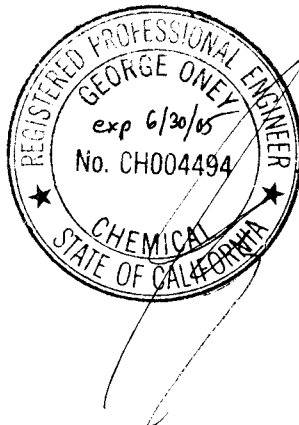
Estimated Remaining Service Life

The tank was installed in 2000. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

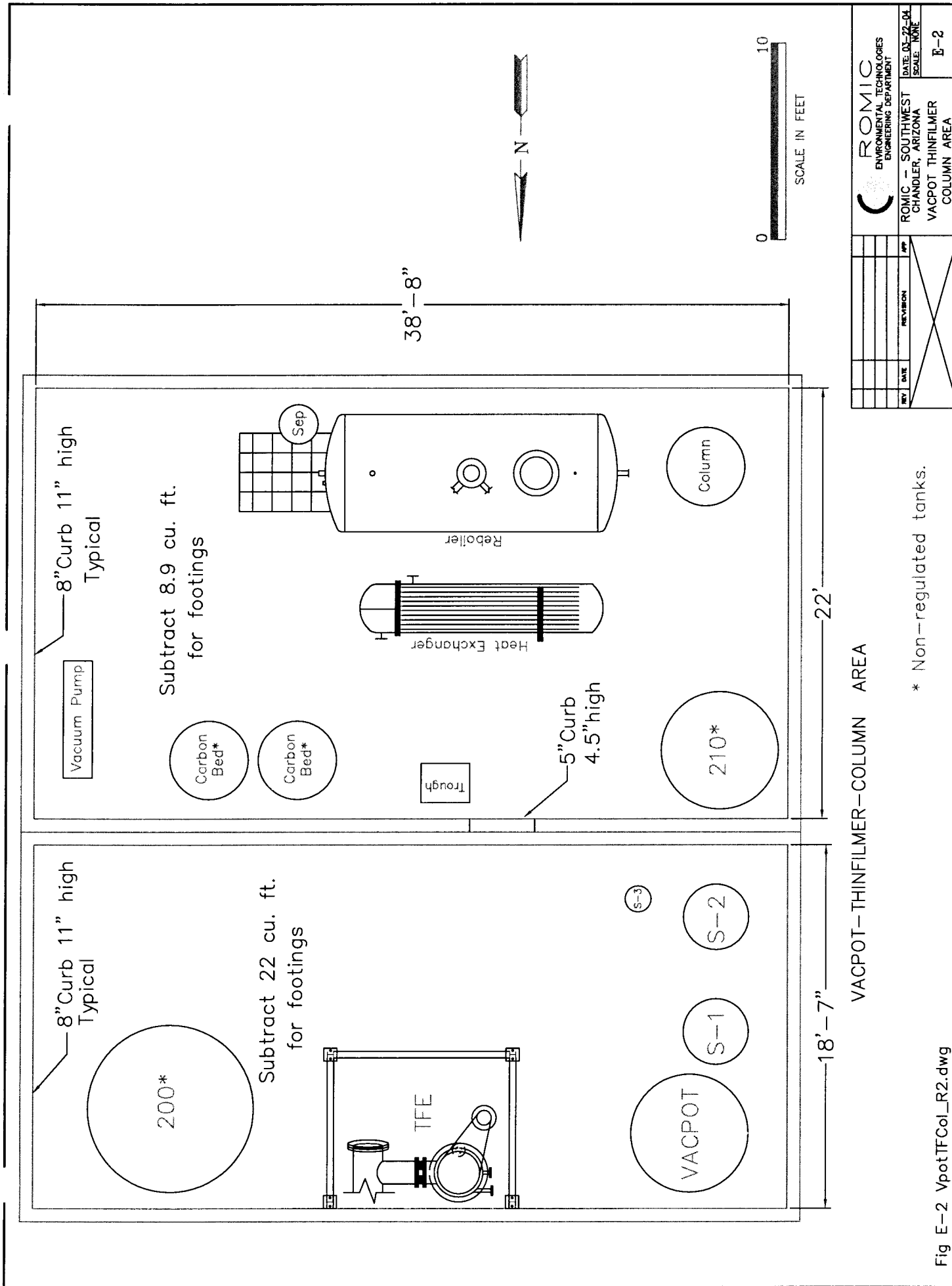
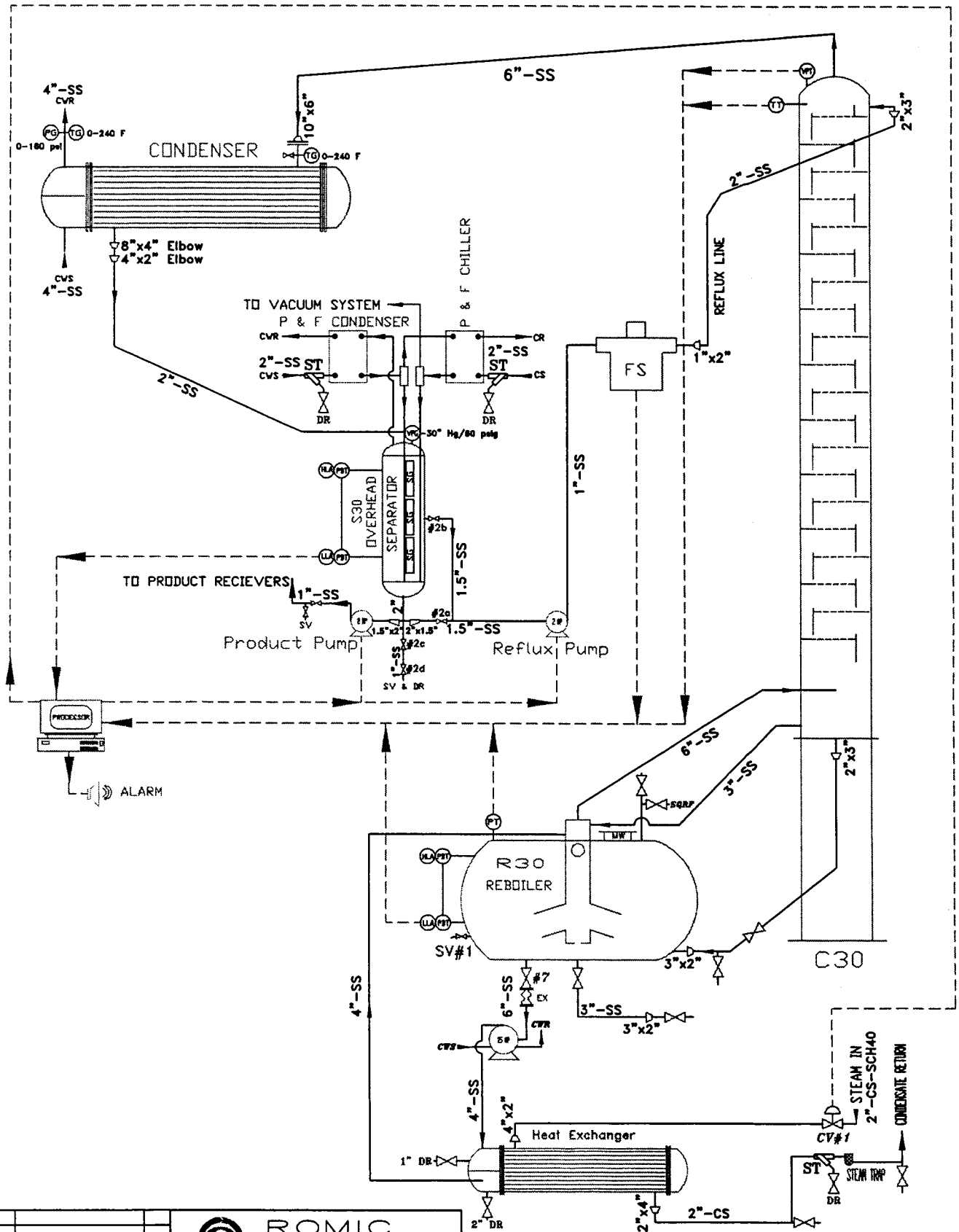


Fig E-2 VpotTFCol_R2.dwg



REV	DATE	REVISION	APP
1	5/04	General revisions	MT

ROMIC
ENVIRONMENTAL TECHNOLOGIES
ENGINEERING DEPARTMENT

ROMIC - SOUTHWEST
CHANDLER, ARIZONA

COLUMN 30
PROCESS FLOW DIAGRAM

DATE: 11-14-02

SCALE: NONE

E-3

I:\RSW_partB_04_final\E-3 Col30

Tank Farm Certification

Tankfarm A

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, Metro Environmental Services, Inc. performed an assessment of Tank Farm "A" at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

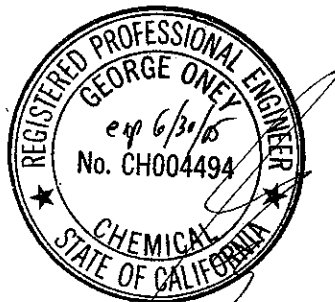
Containment Area Base

Tank Farm "A" is constructed of 10-inch thick, minimum 3,000-psi concrete with two mats of #5 rebar placed at 12" spacing on center each way. A polyethylene liner was installed under the tank farm during construction. The slab is monolithic, thus there are no cold joints in the slab.

CERTIFICATION

Based upon my professional expertise and judgement this containment system has been properly designed and installed to achieve the requirements of 40 CFR 264.193.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Farm Certification

Tankfarm B

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, Metro Environmental Services, Inc. performed an assessment of Tank Farm "B" at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

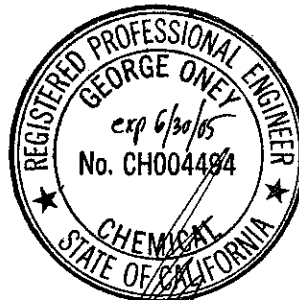
Containment Area Base

Tank Farm "B" is constructed of 10-inch thick, minimum 3,000-psi concrete with two mats of #5 rebar placed at 12" spacing on center each way. A polyethylene liner was installed under the tank farm during construction. The slab is monolithic, thus there are no cold joints in the slab.

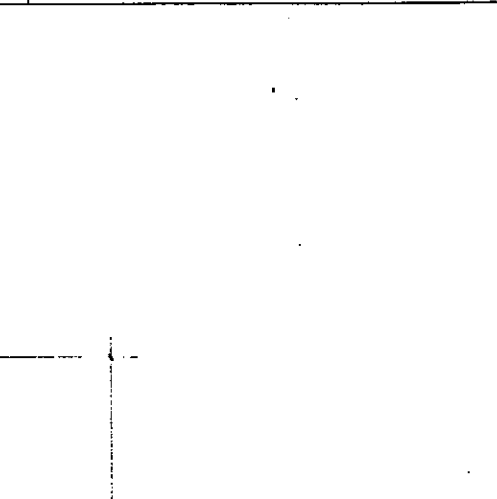
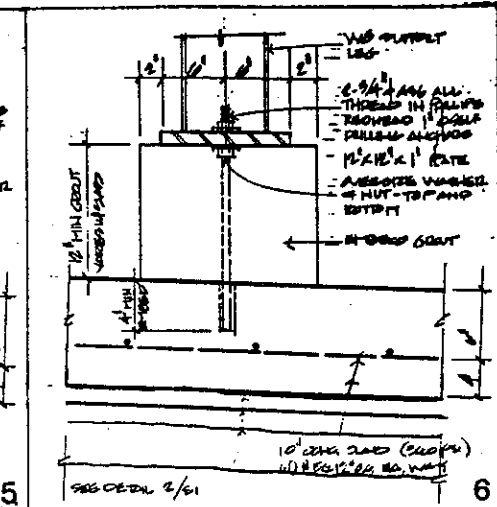
CERTIFICATION

Based upon my professional expertise and judgement this containment system has been properly designed and installed to achieve the requirements of 40 CFR 264.193.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494



THE FOUNDATIONS HAVE BEEN DESIGNED FOR AN AVERAGE SEISMICALLY ZONE 2A AND PRESSURE OF 1800 PSF FOR FOOTINGS EXCAVATING A MINIMUM OF 60 TO 65 FEET BELOW FINISHED GRADE. THIS ASSUMED VALUE IS INCREASED BY 50% AND MUST BE NOTED IN ORDER TO TAKE THE TABLE FORCE INTO CONSIDERATION. THIS ASSUMPTION IS IN ACCORDANCE WITH A CLASS 4 MATERIAL OF TABLE 28-B OF THE A.S.C.C., 1980 EDITION.

CONCRETE

CONCRETE HAS BEEN DESIGNED ACCORDING TO ACI 318-63 WITH THE STRUTTY SECTION METHOD. INSTALLED CONCRETE SHALL CONFORM TO THE FOLLOWING:

CONCRETE SLABS ON GRADE WITH CURBS	5000 PSI	28 DAY STRENGTH
NON-SHEDDING CONCRETE ABOUT LIGHTING HOUS	6000 PSI	AT 7 DAYS

CONCRETE SHALL BE PROPORTIONED ACCORDING TO TEST APPROVED MIXTURES AND WHEN A 10' X 10' X 12" CUBE WILL BE TESTED. THE QUALITY OF THE CONCRETE SHALL BE MAINTAINED THROUGHOUT THE ENTIRE PROJECT. THE MIXTURE SHALL BE IN TABLE 28-B OF THE UNIFORM BUILDING CODE, FOR THE SPECIFIED CONCRETE STRENGTH. CONCRETE SHALL BE PLACED AND CURED ACCORDING TO THE MIXTURE. CONCRETE SHALL CONFORM TO CLASS 4 CONCRETE ACCORDING TO CDS AND WATER TO BE FAVORABLE.

ALL CONCRETE SHALL BE MECHANICALLY VIBRATED IN PLACE AT EXPERIENCED WORKMEN SHOULD BE COMBINE THE IN-PLACE CONCRETE, BUT NOT TO SEGREGATE, INCREASING.

NO ADMIXTURES SHALL BE USED WITHOUT SPECIFIC PRIOR WRITTEN APPROVAL FROM THE ARCHITECT/STRUCTURAL ENGINEER. ADMIXTURES USING NEW FORM OF CHLORIDES SHALL NOT BE USED.

CONCRETE SHALL BE CURED IN PLACE BY ENCLOSED AREA POLYETHYLENE SHEET AND AN APPROVED EMULSION BRAY FILM FOR AT LEAST 14 DAYS AFTER PLACING. ALL SURFACES OF THE CONCRETE SHALL BE KEPT MOIST.

SYSTEMS OF CONCRETE SHALL CONSIST OF ONE TEST IS SPECIFIED, ACCORDING TO ASTM C31, FOR EACH 500 CUBIC YARD OF CONCRETE PLACED AT PARTIAL THICKNESS. FOR EACH BATCH PLACEMENT, AN ASSIGNMENT TESTER SHALL MAKE, FURNISH ALL TESTED SPECIMENS OF EACH BATCH FOR THE A.S.C.C., 1980 EDITION.

40-0
40-1
40-2

REINFORCING STEEL

ALL REINFORCING STEEL DESIGN, FABRICATION AND PLACEMENT SHALL CONFORM TO THE CURRENT EDITIONS OF THE A.C.I., DETAILING MANUAL AND THE A.C.I. CODE.

NATURAL SPECIFICATIONS ARE:

REINFORCING STEEL:	A615-40	Fy = 60 KSI	Fu = 90 KSI	AND SMALLER BARS.
A615-40	Fy = 60 KSI	Fu = 90 KSI	FOR 14 AND LARGER BARS.	
A615-40	Fy = 60 KSI	Fu = 90 KSI		

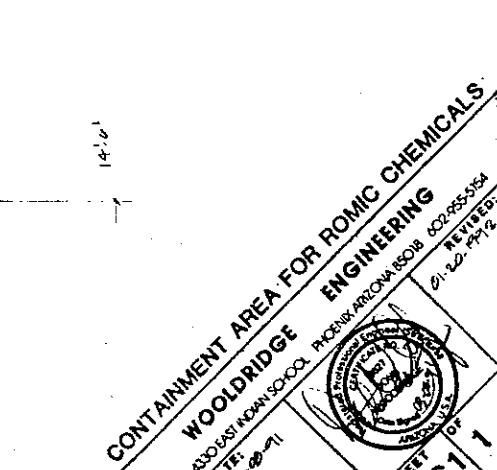
MINIMUM CONCRETE COVERAGE OF ALL REINFORCING STEEL SHALL BE:

UNPAVED CONCRETE AGAINST EARTH:	3 INCHES.
PAVED CONCRETE AGAINST ROCK/FILL EARTH:	2 INCHES.

LAP JOINTS IN CONCRETE SHALL BE 50 BAR DIAMETERS. REINFORCING SHALL BE SPACED ONLY AS APPROVED. REINFORCING MUST BE AS TO SIZE AND SPACING SHALL BE INSTALLED AS CONTINUOUS UNLESS OTHERWISE DETAILED.

ANCHORING REINFORCING BARS SHALL BE INSTALLED IN ALL CORNERS, BARS AND WALL INTERSECTIONS IN ALL MASSIVE AND CONCRETE.

ALL REINFORCING SHALL BE SECURELY TIED IN PLACE TO PREVENT MOVEMENT DURING CONCRETE PLACEMENT.



14-00000

CONTAINMENT AREA FOR ROMIC CHEMICALS

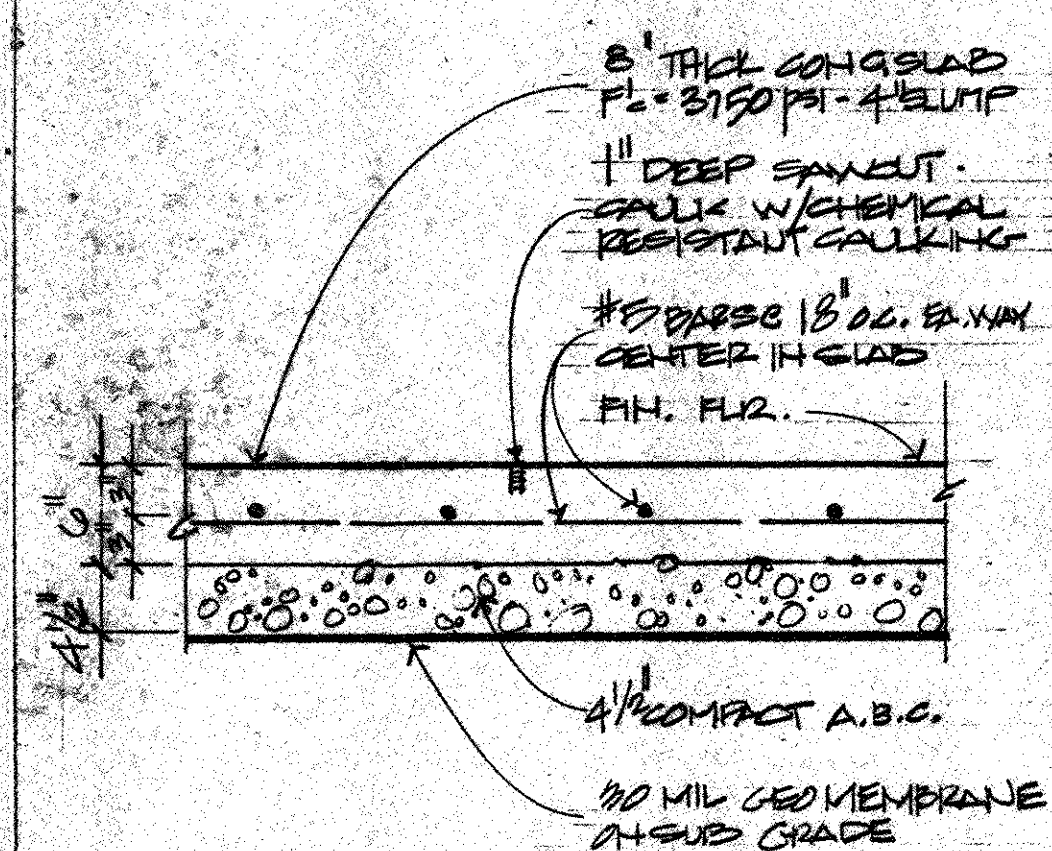
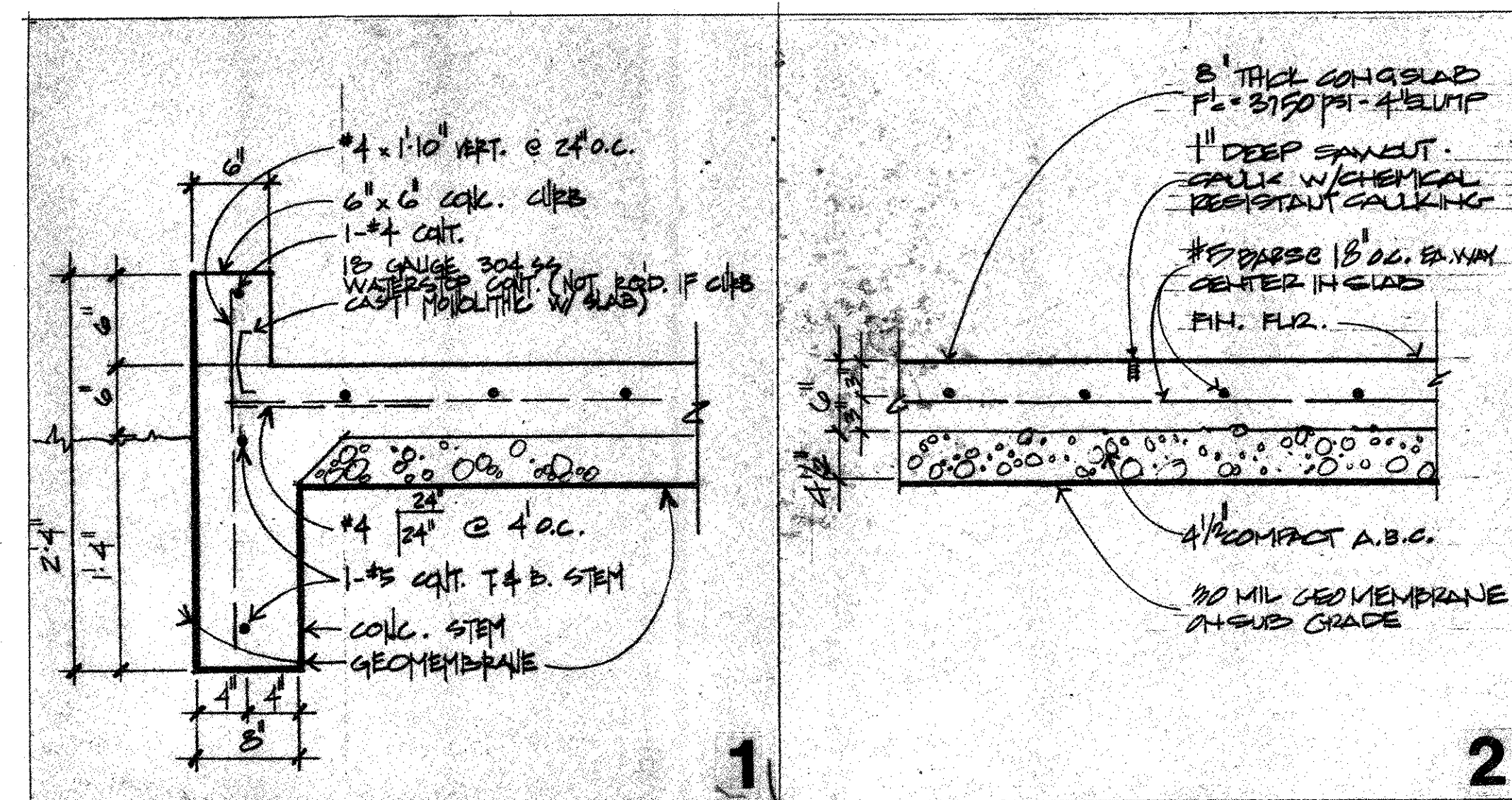
WOOLDRIDGE ENGINEERING

AND LASSI KOWALSKO P.O. BOX 10000808 60285-5008

RECEIVED

11/16/74

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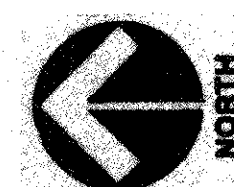
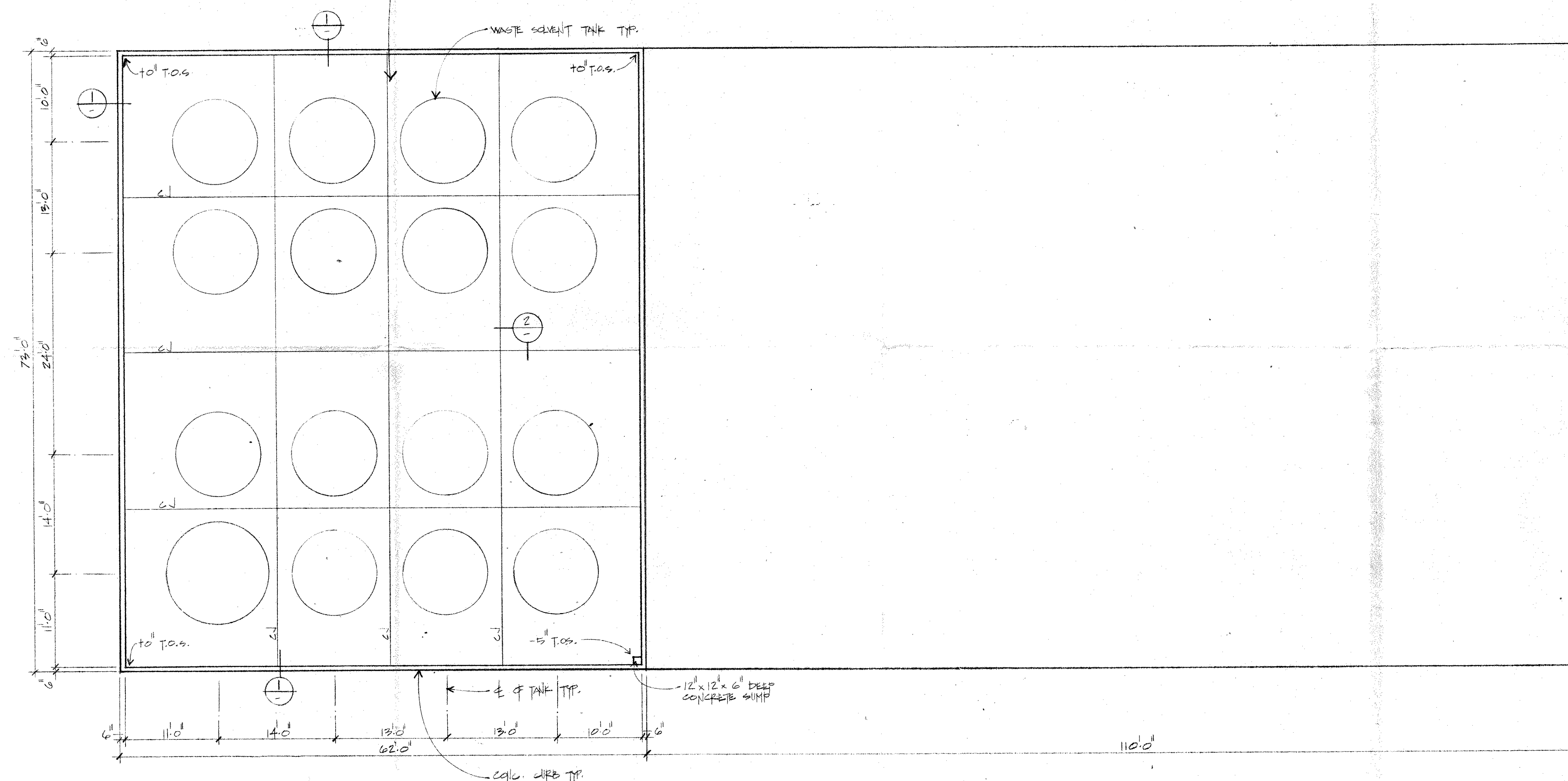
SLAB ON GRADE SHALL BE 8 INCHES THICK. NET, F'C = 3750 PSI, WITH #5 REINFORCING BARS @ 18" O.C. EACH WAY, CENTERED IN THE SLAB. THIS SLAB SHALL BE PLACED UNDER STRICT SUPERVISION AND INSPECTION. SLUMP TESTS AND CYLINDER TESTS SHALL BE TAKEN FROM EACH DELIVERY TRUCK. NO WATER SHALL BE ADDED IN THE FIELD. A PLASTICIZING AGENT SHALL BE USED TO FACILITATE PLACEMENT OF THE CONCRETE, ACCORDING TO THE MANUFACTURER'S, S RECOMMENDATIONS. THE SLAB SHALL BE VIBRATED IN PLACE BY EXPERIENCED WORKMEN.

OVER:

4.5 INCHES OF COMPACTED A.B.C. FILL.

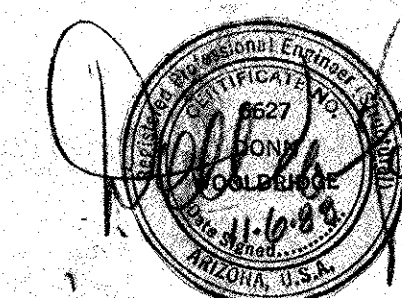
OVER:

A GEOMEMBRANE OF ONE LAYER OF 30 MIL POLY-FLEX POLYETHYLENE MEMBRANE BY POLY-AMERICA, INC. (1-800-527-3322). THIS MEMBRANE IS TO BE A ONE PIECE MATERIAL AND UNPIERCED AT THE FINISH OF CONSTRUCTION. THIS GEOMEMBRANE MUST BE INSTALLED WITH GREAT CARE SUCH THAT IT WILL EXIST AS A MOISTURE BARRIER AND MEMBRANE. NO GRADE STAKES, SCREEDS, BRACES OR ANY OTHER FORM OF CONSTRUCTION IS ALLOWED WHICH MAY CAUSE A PUNCTURE.



PLAN $\frac{1}{8}'' = 1'-0''$

**WASTE SOLVENT TANK FARM
FOR
ROMIC CHEMICAL CORPORATION
SOUTHWEST**



WOOLDRIDGE ENTERPRISES Structural Engineers
4330 E. Indian School Road 602-955-5154
Phoenix Arizona 85018

C-101

Tank Farm Certification

Tankfarm C

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, Metro Environmental Services, Inc. performed an assessment of Tank Farm "C" at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

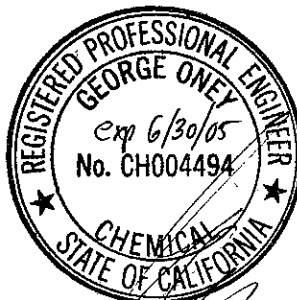
Containment Area Base

Tank Farm "C" is constructed of 10-inch thick, minimum 3,000-psi concrete with two mats of #5 rebar placed at 12" spacing on center each way. A polyethylene liner was installed under the tank farm during construction. The slab is monolithic, thus there are no cold joints in the slab.

CERTIFICATION

Based upon my professional expertise and judgement this containment system has been properly designed and installed to achieve the requirements of 40 CFR 264.193.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Farm Certification

Tankfarm D

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, Metro Environmental Services, Inc. performed an assessment of Tank Farm "D" at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

Containment Area Base

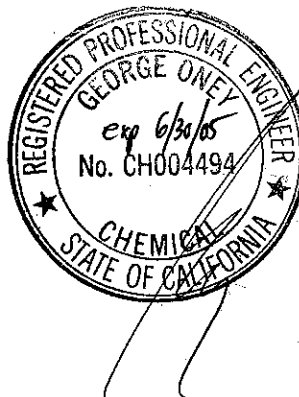
Tank Farm "D" is constructed of 10-inch thick, minimum 3,000-psi concrete with two mats of #5 rebar placed at 12" spacing on center each way. A polyethylene liner was installed under the tank farm during construction. The slab is monolithic, thus there are no cold joints in the slab.

CERTIFICATION

Based upon my professional expertise and judgement this containment system has been properly designed and installed to achieve the requirements of 40 CFR 264.193.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494





Liner being unrolled under tank farm



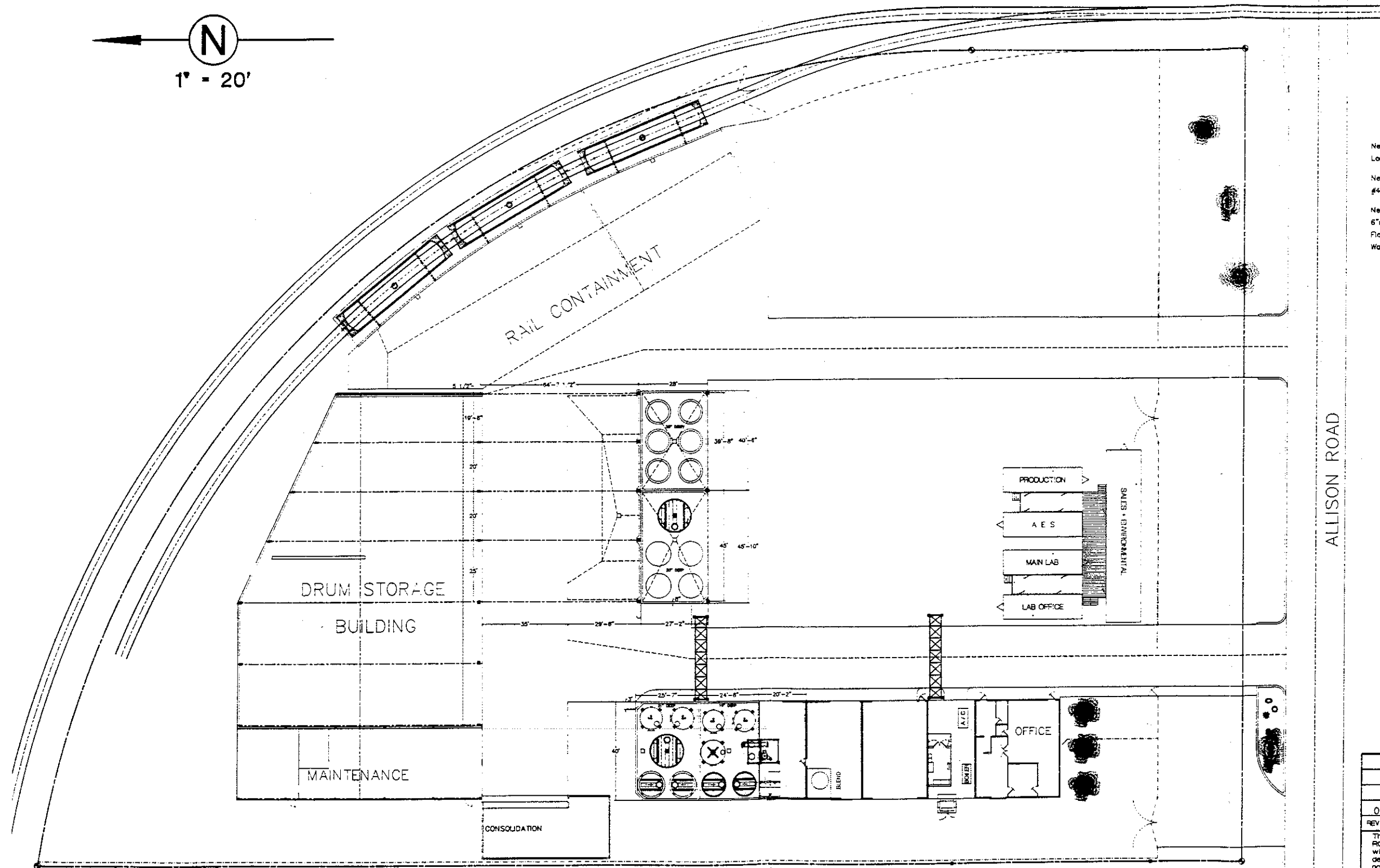
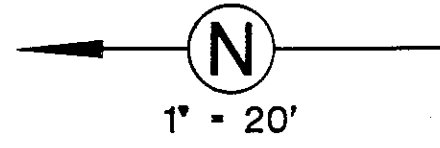
Liner seal being tested for leaks



Sump area for liner being installed



Final preparations on liner prior to covering



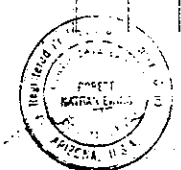
New curb and gutter to match existing per
Lone Butte Industrial Park Standards

New drives to be 6" thick 3000 psi Fibermesh concrete, with
#4 rebar @ 16" OC, both ways, over 6" min compacted AB.

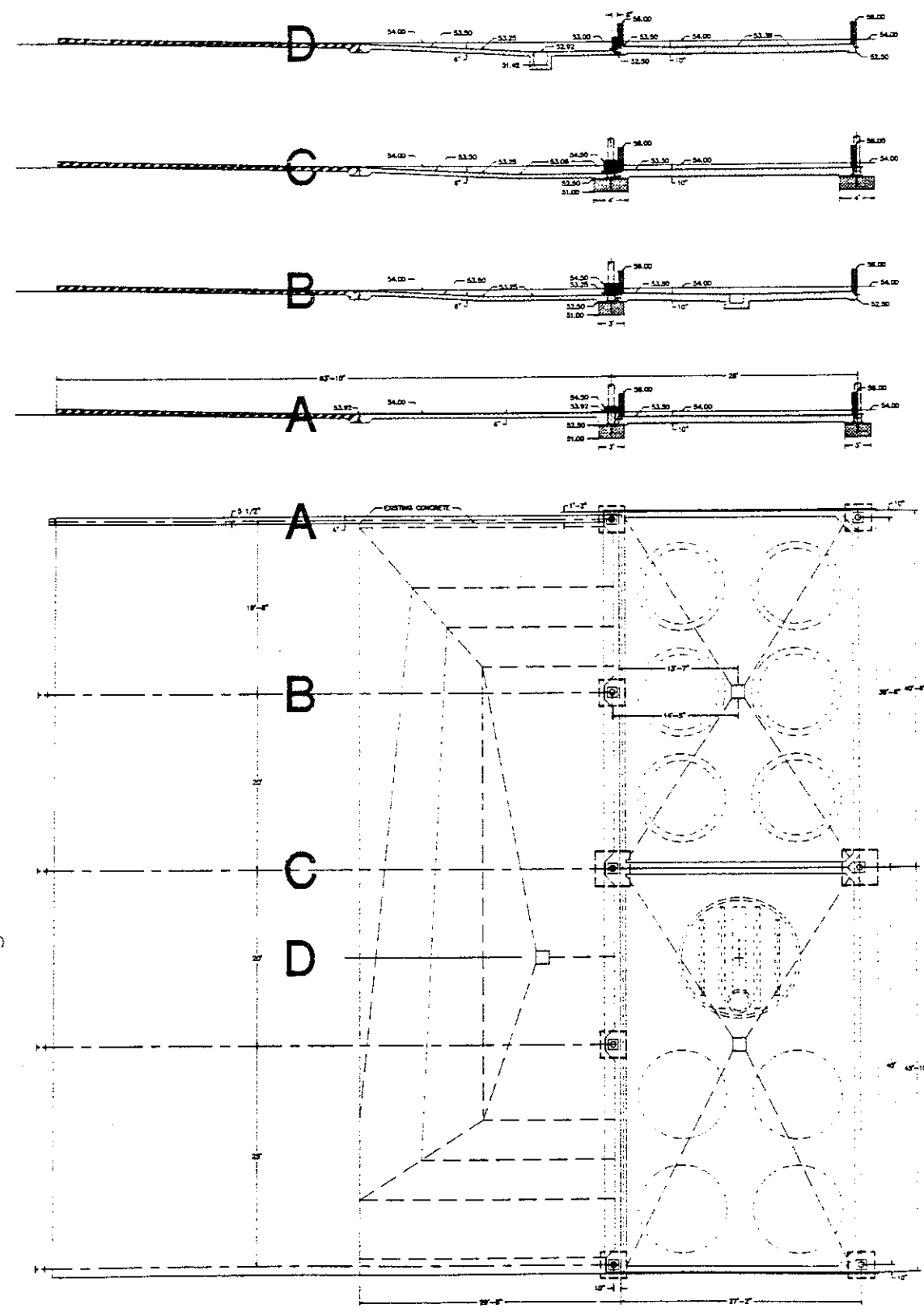
New containment areas to be 3000psi Fibermesh concrete over
6" min compacted AB as follows:
Floors: 10" thick with #5 rebar @ 12" OC, both ways;
Walls: 8" thick with #5 rebar @ 12" OC, both ways.

P103ADWG 11-15-91

0 11-15-91 To GRUC for Permit		RAP	
REV	DATE	REVISION	BY CHK APP
This drawing, including the information it contains, is the property of ROMIC CHEMICAL CORP. This drawing is to be used only in connection with the project to which it pertains, and may not be used in any manner detrimental to the interests of ROMIC CHEMICAL CORP. This drawing is not to be copied without permission, and must be returned upon request.			
 ROMIC CHEMICAL CORPORATION ENGINEERING DEPARTMENT		DATE: 15 NOV 91	
ROMIC CHEMICAL - SOUTHWEST 6760 W. ALLISON ROAD CHANDLER, ARIZONA		DRAWING NO.	
PLOT PLAN NEW TANK FARM AREAS		P103 SHEET 1 OF 1	



Existing Warehouse

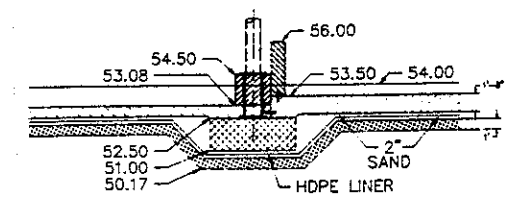


PLAN - 1/8" = 1'-0"

New curb and gutter to match existing per
Lone Butte Industrial Park Standards

New drives to be 6" thick 3000 psi Fibermesh concrete, with
#4 rebar @ 16" OC, both ways, over 6" min compacted AB.

New containment areas to be 3000psi Fibermesh concrete over
6" min compacted AB as follows:
Floors: 10" thick with #5 rebar @ 12" OC, both ways;
Walls: 8" thick with #5 rebar @ 12" OC, both ways.



1/4" = 1'-0"

0	12-15-91	To G.R.I.C. for Permit	RAP		
REV	DATE	REVISION	BY	CHK	APP

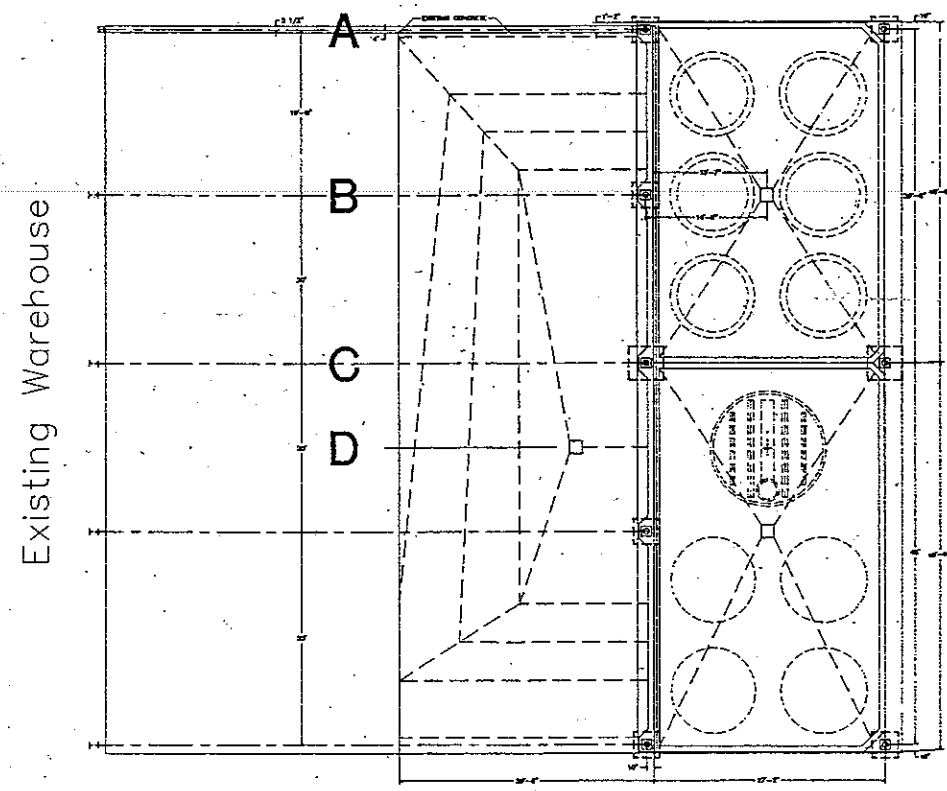
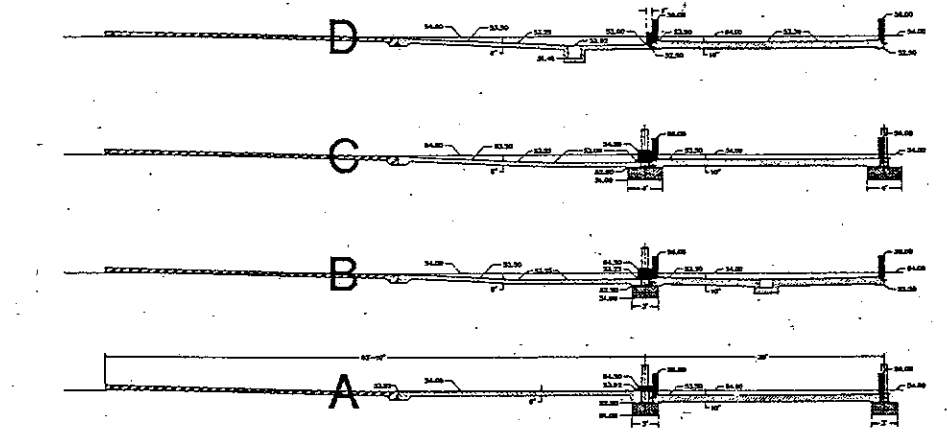
This drawing, including the information it contains, is the property of ROMIC CHEMICAL CORP. This drawing is to be used only in connection with the project to which it pertains, and may not be used in any manner detrimental to the interests of ROMIC CHEMICAL CORP. This drawing is not to be copied without permission, and must be returned upon request.

ROMIC
CHEMICAL CORPORATION
ENGINEERING DEPARTMENT

ROMIC CHEMICAL - SOUTHWEST
6760 W. ALLISON ROAD
CHANDLER, ARIZONA

DATE: 15 DEC 91
SCALE: AS SHOWN
DRAWING NO. **P103**
SHEET 2 OF 4





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

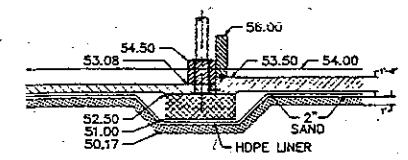
New curb and gutter to match existing per
Lone Butte Industrial Park Standards

New drives to be 6" thick 3000 psi Fibermesh concrete, with
#4 rebar @ 16" OC, both ways, over 6" min compacted AB.

New containment areas to be 3000psi Fibermesh concrete over
6" min compacted AB as follows:

Floors: 10" thick with #5 rebar @ 12" OC, both ways.

Walls: 8" thick with #5 rebar @ 12" OC, both ways.



1/4" = 1'-0"

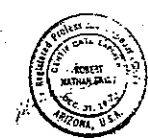
0	12-15-91	To GRUC for Permit	RAP
REV	DATE	REVISION	BY CHK APP

This drawing, including the information it contains, is the property of ROMIC CHEMICAL CORP. This drawing is to be used only in connection with the project to which it pertains, and may not be used in any manner detrimental to the interests of ROMIC CHEMICAL CORP. This drawing is not to be copied without permission, and must be returned upon request.

ROMIC
CHEMICAL CORPORATION
ENGINEERING DEPARTMENT

ROMIC CHEMICAL - SOUTHWEST
6760 W. ALLISON ROAD
CHANDLER, ARIZONA

DATE: 15 DEC 91
SCALE: AS SHOWN
DRAWING NO.
P103
SHEET 2 of 4



P10303.DWG 12-15-91

Tank Farm Certification

Tankfarm E

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, Metro Environmental Services, Inc. performed an assessment of Tank Farm "E" at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

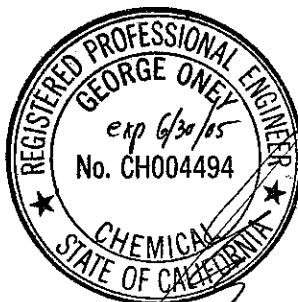
Containment Area Base

Tank Farm "E" is constructed of 10-inch thick, minimum 3,000-psi concrete with two mats of #5 rebar placed at 12" spacing on center each way. A polyethylene liner was installed under the tank farm during construction. The slab is monolithic, thus there are no cold joints in the slab.

CERTIFICATION

Based upon my professional expertise and judgement this containment system has been properly designed and installed to achieve the requirements of 40 CFR 264.193.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Farm Certification

Tankfarm F

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, Metro Environmental Services, Inc. performed an assessment of Tank Farm "F" at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

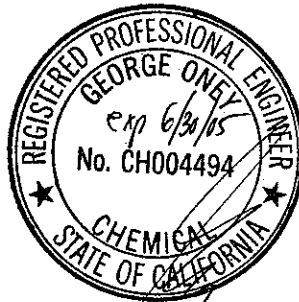
Containment Area Base

Tank Farm "F" is constructed of 10-inch thick, minimum 3,000-psi concrete with two mats of #5 rebar placed at 12" spacing on center each way. A polyethylene liner was installed under the tank farm during construction. The slab is monolithic, thus there are no cold joints in the slab.

CERTIFICATION

Based upon my professional expertise and judgement this containment system has been properly designed and installed to achieve the requirements of 40 CFR 264.193.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Farm Certification

Tankfarm G

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, Metro Environmental Services, Inc. performed an assessment of Tank Farm "G" at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona.

ASSESSMENT ITEMS

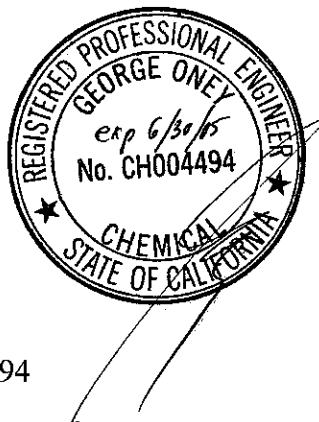
Containment Area Base

Tank Farm "G" is constructed of 10-inch thick, minimum 3,000-psi concrete with two mats of #5 rebar placed at 12" spacing on center each way. A polyethylene liner was installed under the tank farm during construction. The slab is monolithic, thus there are no cold joints in the slab.

CERTIFICATION

Based upon my professional expertise and judgement this containment system has been properly designed and installed to achieve the requirements of 40 CFR 264.193.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Certification Report

Tank T-101

Prepared for: Romic Environmental Technologies Corp.
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #101, a 5,800-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 5,800-gallon tank, (Tank #101), is constructed of carbon steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of carbon steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank is supported by four steel legs that rest directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located in a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

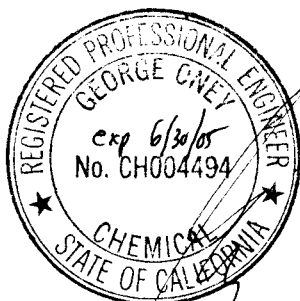
Estimated Remaining Service Life

The tank was installed in 1991. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Certification Report

Tank T-102

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005, in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #102, a 5,800-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 5,800-gallon tank, (Tank #102), is constructed of carbon steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of carbon steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank is supported by four steel legs that rest directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located in a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

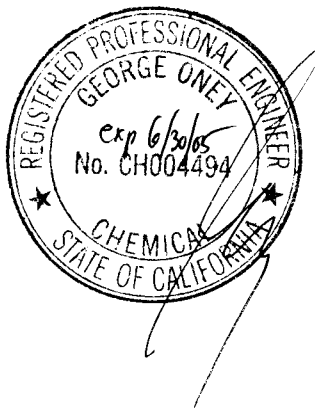
Estimated Remaining Service Life

The tank was installed in 1991. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Certification Report

Tank T-103

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #103, a 5,800-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 5,800-gallon tank, (Tank #103), is constructed of carbon steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of carbon steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank is supported by four steel legs that rest directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located in a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

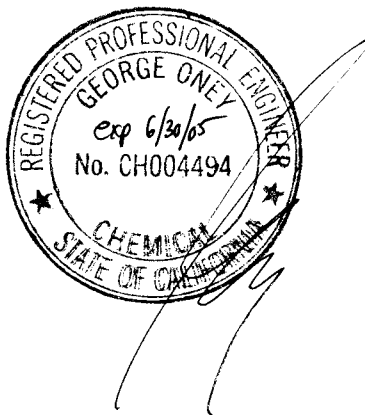
Estimated Remaining Service Life

The tank was installed in 1992. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Tank Certification Report

Tank T-104

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #104, a 5,800-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 5,800-gallon tank, (Tank #104), is constructed of carbon steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of carbon steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank is supported by four steel legs that rest directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located in a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

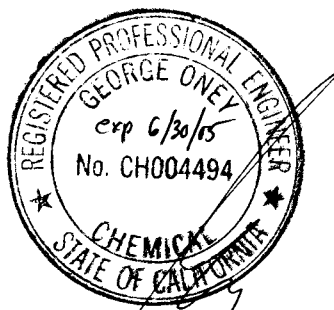
Estimated Remaining Service Life

The tank was installed in 1992. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-101 to TK-104

Weight: 4,000± lbs. Empty

Location: Tank Farm AB

81,400± lbs. Full

Service: Waste Receiving/Storage

Temp (°F) Ambient

Contents: Organic/aqueous

Pressure (Psig): ATM

Size: 5,800 gal. S.G.: 1.0-1.6

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: Carbon Steel

Support: 4 Legs

Method of Construction: Welded

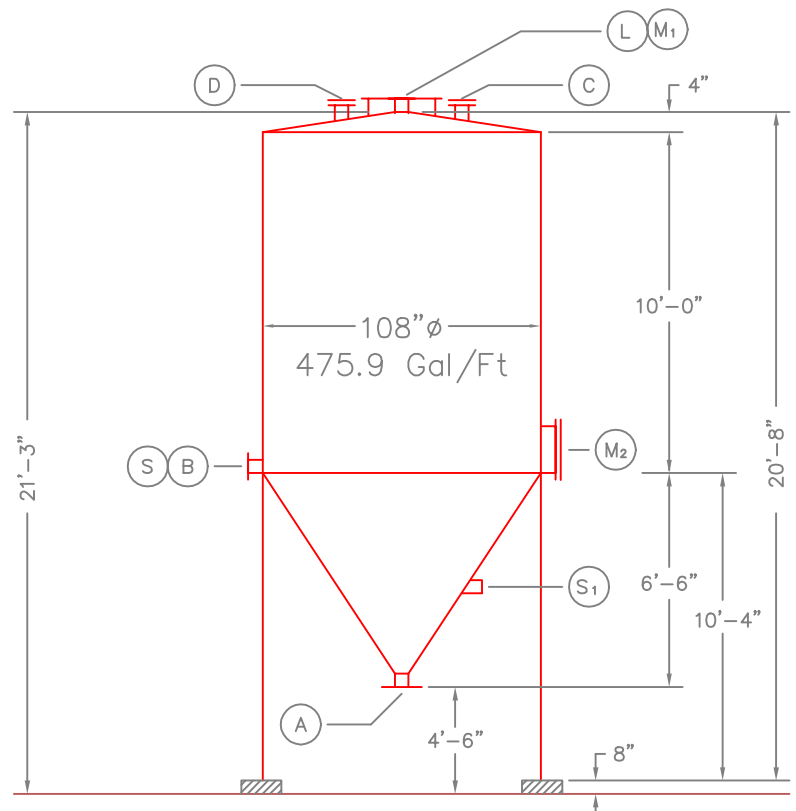
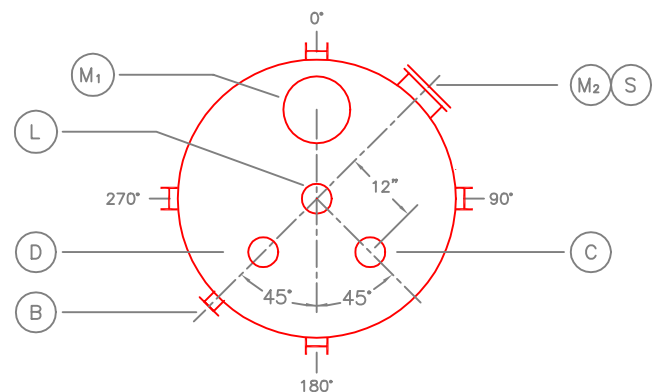
Insulation: n/a Agitator: n/a

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	3"	RF	150#	SIDE OUTLET
C	3"	RF	150#	VENT
D	3"	RF	150#	SPARE
L	3"	RF	150#	LEVEL INDICATOR
M ₁	24"	FF	n/a	TOP MANWAY
M ₂	24"	FF	n/a	SIDE MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard 1:12 sloped top.
2. Bottom cone with 70.2° included angle.
3. Tank supported on 4 legs.
4. See Brown Tank & Steel W/O-3882.



Rev No.	Revision	By	Date	Apprvd	Date	
1	ADD TANKS 106 TO 108	MW	11-13-95			
2	Update for 2004 Part B	RP	4-7-04	WK	4-04	
3	Revise Temperature rating	RP	8-22-05	MS	8-05	



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number Tks 101 – Tks 104

METRO ENVIRONMENTAL SERVICES, INC.

1256-B West Brooks Street, Ontario, CA 91762
Tel: (909) 983-3848 Fax: (909) 983-3498

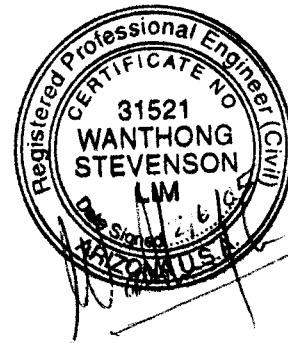
LSI PN: 2K502 Tank 101, 102, 103 & 104
Project Name: ROMIC Environmental Technologies Corporation
Project Location: ROMIC Southwest, Chandler, Arizona.

Issued: 01/31/05

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1	Scope of work, design loads and tank data	1
2	Seismic and wind analysis for overturning moment	2
3	Check support column, base plate and anchor bolts	3



SCOPE OF WORK: **Tank Designation: 101 to 104**

— Analyzed existing anchorage for 9'-0" Diameter by 16'-6" high tank with (4) W8x24 legs.

- Check existing 1"x 12" x 12" base plate w/(2) 7/8" dia. anchor bolts.

DESIGN LOADS:

2000 International Building Code. 80 MPH wind, Seismic Use group II

WIND: $F = Q_z * G * C_f * A_f$

Where $Q_z = 0.00256 K_z K_{zt} K_d V^2 I$

$Q_z = 0.00256 * 0.9 * 1.0 * 0.95 * 90^2 * 1.0 = 17.73 \text{ psf}$

F wnd = 2532 lbs.

M otm = F wind * H otm = 40508 lbs-ft

H =	21.33	ft
D =	9	ft
K _z =	0.9	Tbl 6-3 Case2
K _{zt} =	1	Tbl 6-4 Flat
K _d =	0.95	Tbl 6-4
V =	90	MPH Fig 6-1
I =	1	Tbl 6-1
For H/D =	2.37	
C _f =	1.4	Tbl 6-19
G _f =	0.85	Sec 6.5.8
A _f =	120	Sq. Ft.
H otm =	16	ft

Location: Chandler

State: Arizona

Siteclass: D

From Fig. 1615(1): S_s = 0.21 g

From Fig. 1615(2): S₁ = 0.063 g

F_a = 1.6 Tbl 1615.1.2(1)

R = 3 Tbl 1622.2.5(1)

Omega = 2 Tbl 1622.2.5(1)

I_e = 1.25 Tbl 1622.2.5(2)

— S_{ds} = 0.67 F_a S_s = 0.224 W

W = 83000 lbs

V seismic = C_s W Eq. 16-34
= 0.093 W

C_s = S_{ds} / R * I = 0.0933

C_s min = 0.044 S_{ds} I = 0.0123

Use C_s = 0.0933

$T = 0.00000765 * (L / D)^2 * (W D / t)^{0.5} = 0.000000765 * (16.5/9)^2 * (46000/16.5 * 9/0.34)^{0.5}$
= 0.000842 < 0.06 Rigid Structure

V_{simplified} = 1.2 S_{ds} W / R = 0.090 W

V_{nonstr} = 0.14 S_{ds} I_e = 0.039 W

C_s min nonstr = 0.8 S₁ I / R = 0.021 W

V_{s rigid nonstr} = 0.3 S_{ds} I W = 0.084 W

Use V_s = 0.093 W

V_{s asd} = 0.067 W

Overturning Moment = V_s W * 1.2 sloshing * H otm = 106240 lbs-ft **Seismic Control**

Check existing anchorage according to API 650 Appendix E - Seismic design of Storage Tanks

Given information:

Material: Carbon steel
Thickness: 0.34"
Concrete slab thickness: Min 6"
Full Tank +wt tank: 81400 lbs
Agitator: 0 lbs
Misc valves and structures: 1600 lbs

Seismic Analysis per API-650 Appendix E

Seismic zone, $Z =$	(Zone 4=0.4, zone 3=0.3, zone 2=0.2, zone 1=0.075)	0.40
Seismic Importance factor, $I_s =$	(Max $I = 1.5$, normally $I = 1.0$)	1.25
Site coefficient from soil type, $s =$	($S_4=2$, $S_3=1.5$, $S_2=1.2$, $S_1=1.0$)	1.50
Specific gravity of liquid, $G =$		1.6
Tank diameter, $D =$		9.00 ft
Height of tank, $H_t =$		21.33 ft
Fill height from top of floor, $H =$		21.33 ft
Weight of content, $W_t =$	$22/7 * (D/2)^2 * H * 62.4 \text{ pcf} / 1000 =$	77.40 kips
Weight of shell, uncorroded, $W_s =$	$.49 * (.34 / 12 * 2 * 22/7 * R * 10) =$	3.927 kips
Weight of roof steel, uncorroded, $W_r' =$	$.49 * .20 / 12 * 2 * 22/7 * 4.5 =$	0.219 kips
Roof equipment load in seismic, $W_e =$		0.10 kips
Ratio of $D / H =$		0.42
Weight of roof & equipment load, $W_r = W_r' + W_e =$		0.32 Kips
Height of center of gravity of shell, $X_s = H / 2 =$		10.67 ft
From Figure E-2 Effective masses, $W_1 / W_t =$	0.934	0.93
Contents in unison w/ shell, $W_1 = W_t * (W_1 / W_t) =$		72.30 Kips
From Figure E-2 Effective masses, $W_2 / W_t =$	0.113	0.11
First sloshing mode contents, $W_2 = W_t * (W_2 / W_t) =$		8.78 Kips
From Figure E-3 Centroids of seismic forces, $X_1 / H =$	0.457	0.46
Height to centroid, $X_1 = H * (X_1 / H) =$		9.74
From Figure E-3 Centroids of seismic forces, $X_2 / H =$	0.855	0.86
Height to centroid, $X_2 = H * (X_2 / H) =$		18.24
From Figure E-4 Factor k , $k =$	0.581	0.58
Natural period of first mode, $T = k * (D)^{0.5} =$		1.73 seconds
Lateral force coefficient, $C_1 = 0.24$		0.24
Lateral force coefficient, $C_2 = C_2 = 0.3S/T =$		0.26

Base shear $V_s = Z * I * (C_1 * (W_s + W_r + W_1) + C_2 * W_2) =$	10.33 Kips
Overturning, $M_{ot} = Z * I * (C_1 * W_s * X_s + C_1 * W_r * H_t + C_1 * W_1 * X_1 + C_2 * W_2 * X_2) =$	133.60 K-ft
Friction resistance from contents, shell, roof steel, $F_{fric} = 0.4 * (W_t + W_s + W_r) =$	32.62 Kips
Factor of safety for sliding, $F_{Ss} = F_{ric} / V_s =$	3.16 > 1.5

Calculate resistance load against overturning:

Yield strength of tank material, $F_y =$	36.00 ksi
Thickness of bottom plate, $t_b = \max(t_f - c_o)$, thickness of floor or 0.25 =	1.00
Wt of contents allow for OT calc. per circumference, $W_L = 7.9 t_b (F_y G H)^{0.5} =$	8756.56 plf
Max allowable for $W_L = 1.25 G H D =$	383.94 plf
Resistance to OT by contents, $P_r = 22/7 * D * W_L =$	10.86 Kips
Resistance to OT by shell and roof, $P_{sr} = W_s + W_r =$	4.25 Kips
Total resistance to OT moment, $M_r = (P_r + P_{sr}) * D / 2 =$	67.98 k-ft

Mot > Mr, Anchorage required**Wind analysis per API 650 section 3.11 Wind load on Tanks**

Based on 30 psf on vertical plane surface or 22 psf on projected area of cylindrical surface	
Wind pressure, $q_w =$	22.00 psf
Base shear from wind, $V_w = q_w * H_t * \text{Area} =$	2.64 Kips
Overturning due to wind, $M_{otmw} = V_w * H_t / 2 =$	42.24 K-ft

Since Resistance to Overturning of tank < seismic or wind overturning, anchorage req'd.

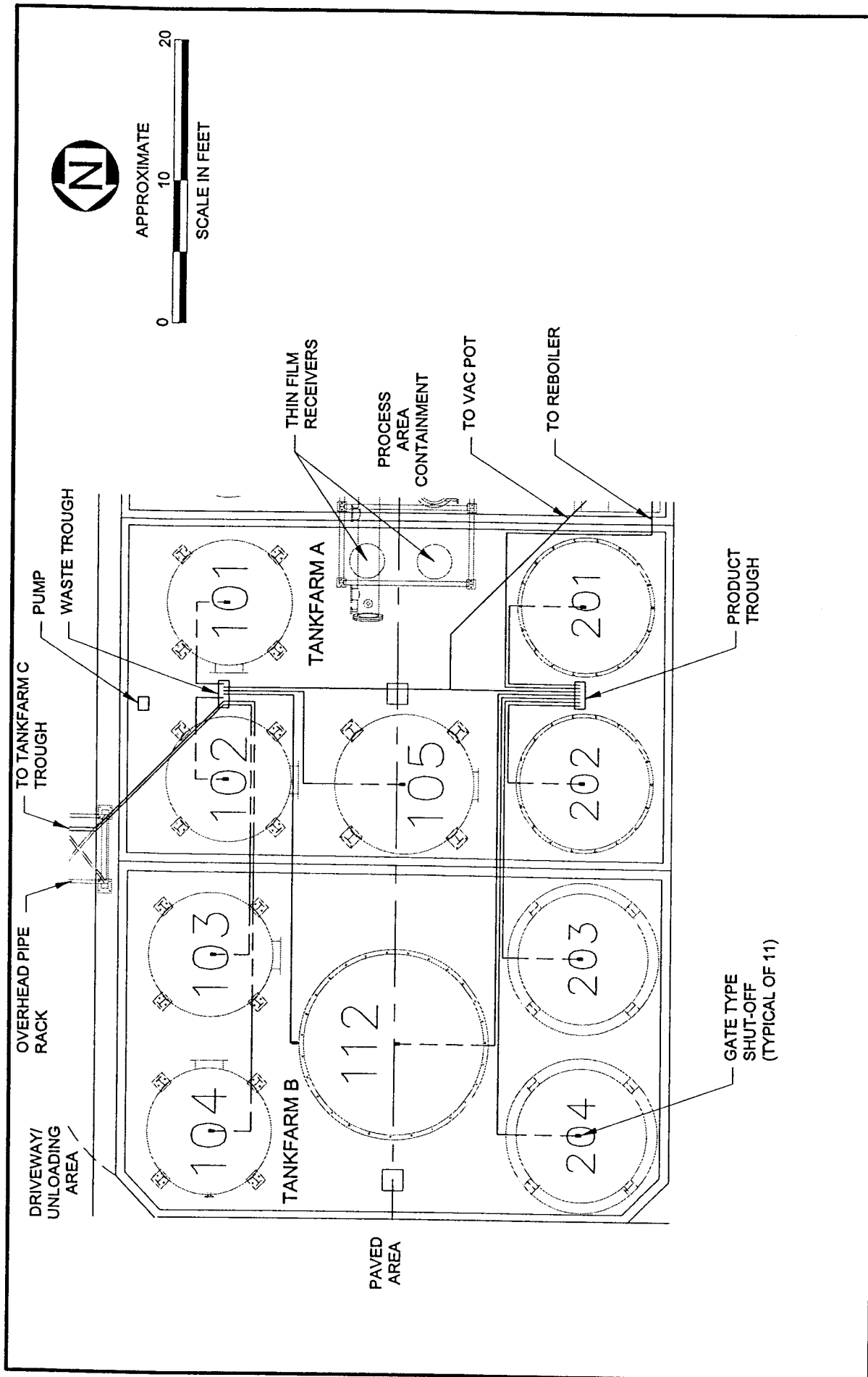
Check existing support column, base plate and anchor bolts.

$$\begin{aligned} \text{Overturning, } M_o &= Z * I * (C1 * W_s * X_s + C1 * W_r * H_t + C1 * W1 * X1 + C2 * W2 * X2) = & 133.60 \text{ k-ft} \\ \text{Base shear } V_s &= Z * I * (C1 * (W_s + W_r + W1) + C2 * W2) = & 10.33 \text{ Kips} \\ \text{Shear along W8x24 column} &= 133.67 / 9 \text{ ft / 2 cols} = & 7.42 \text{ Kips} \\ \text{Capacity of existing 1/4 fillet weld at 12" each side} &= 0.928 * 4 * 2 * 12 = & 89.09 \text{ Kips O.k.} \\ \text{Capacity of W8x24 for 11 ft in axial compression} &= (\text{fr AISC 3-31}) = & 107 \text{ Kips O.k.} \\ \text{Shear per each bolt} &= V_s / 4 \text{ col} / 2 \text{ bolts each} = & 1.29 \text{ Kips O.K.} \\ \text{Tension load at (2) 7/8" diameter bolts} &= 7.42 / 2 \text{ bolts} = & 3.71 \text{ Kips OK} \\ \text{Cap of pullout cone fr each bolt} &= .55 * .65 * (22/7 * 12^2/4) * (3000)^{0.5} * 4/3 * 3 * 1 & 8.86 \text{ Kips O.k.} \\ \text{Combined shear \& tension} &= (1.29/6)^{(5/3)} + (3.71/11.5)^{(5/3)} = & 0.22891 < 1.33 \end{aligned}$$

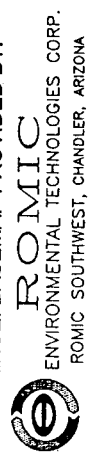
Check 1" x 12" x 12" base plate:

$$\begin{aligned} \text{Fr AISC 3-106: } n &= 2 \text{ in. } m = 2 \text{ in. } F_y = .75 * 36 = 27 \\ f_p &= 7.42 * 2.2 / 12/12 = 0.113 \text{ ksi} \\ t_{\min} &= 2m * (f_p / F_y)^{0.5} = 0.26 \text{ in.} \\ t_{\min} &= 2n * (f_p / F_y)^{0.5} = 0.26 \text{ in. } 1 > 0.26 \text{ O.K.} \\ \text{Shear} &= 7.42 * 2.2 / 8 = 2.04 \text{ Kips} < V_{all} = 6.0 * 1.7 = 10.2 \text{ Kips} \end{aligned}$$

Existing (4) W8x31 columns w/(2) 7/8" dia. Anchors bolts with 1x12x12 base plate is adequate to resist the overturning moment.



REFERENCE: BASEMAP PROVIDED BY:



Tankfarm A & B Romic - Southwest Chandler, Arizona

Figure D-6

Tank Certification Report

Tank T-105

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 7, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #105, a 5,900-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 5,900-gallon tank, (Tank #105), is constructed of carbon steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of carbon steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank is supported by four steel legs that rest directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located in a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

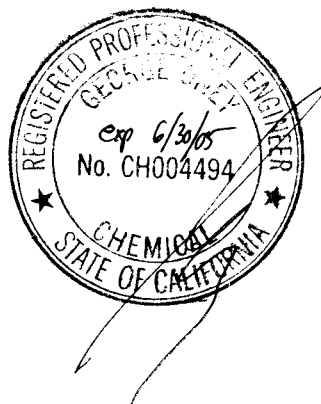
Estimated Remaining Service Life

The tank was installed in 1992. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-105

Weight: 5,000± lbs. Empty

Location: Tank Farm AB

83,700± lbs. Full

Service: Fuels/ Still Bottoms

Temp (°F) 300° MAX

Contents: Organic/aqueous

Pressure (Psig): ATM

Size: 5,900 gal. S.G.: 1.0-1.6

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: Carbon Steel

Support: 4 Legs

Method of Construction: Welded

Insulation: n/a Agitator: 7 1/2 HP

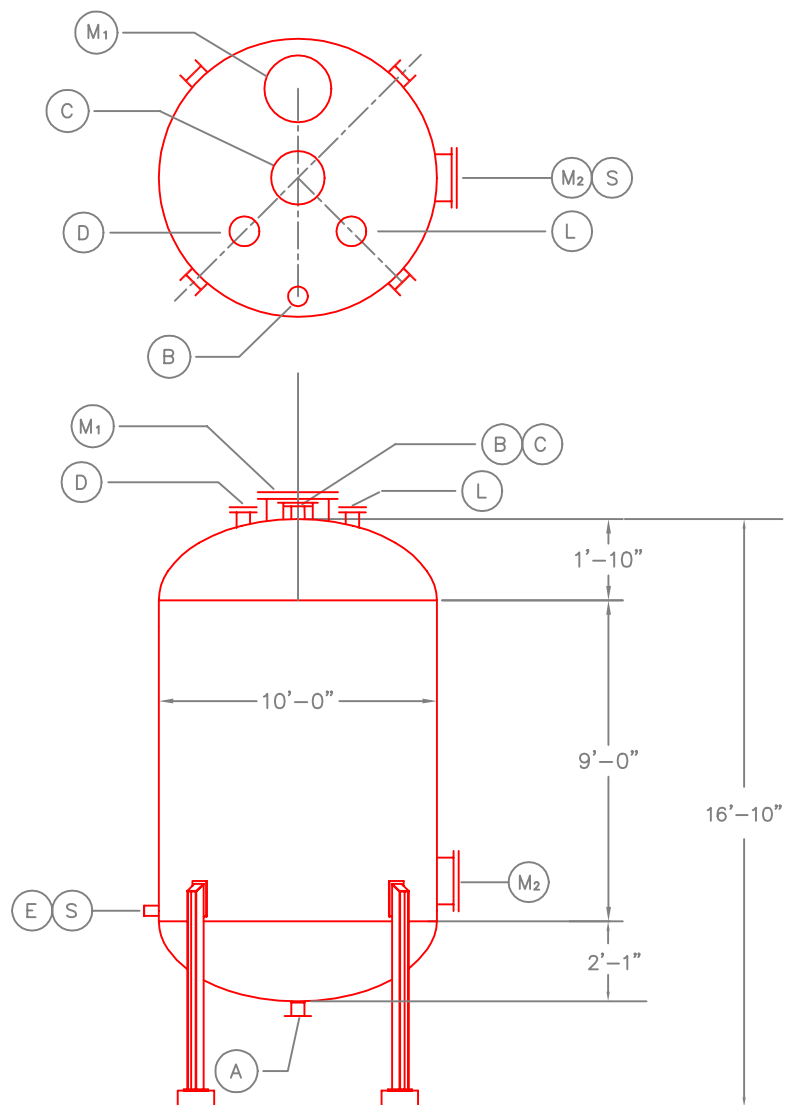
Other: Four Baffles 8"w, 1" from wall

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	3"	RF	150#	SIDE OUTLET
C	16"	RF	150#	AGITATOR
D	3"	RF	150#	SPARE
E	2"	RF	150#	LEVEL INDICATOR
L	2"	RF	150#	TOP LEVEL
M ₁	18"	FF	n/a	TOP MANWAY
M ₂	18"	FF	n/a	SIDE MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Elliptical 2:1 Ratio top & bottom heads
2. Tank supported on 4 legs.
3. Internal baffles (4)-8"x174"L mounted 1" from wall at 90°



Rev No.	Revision	By	Date	Apprvd	Date	 ROMIC ENVIRONMENTAL TECHNOLOGIES CORP. ROMIC SOUTHWEST, CHANDLER, ARIZONA
1	Update for 2004 Part B	RP	4-7-04	WK	4-04	
2	Revise Temperature rating	RP	8-22-05	MS	8-05	
Drawing Number Tk 105						

METRO ENVIRONMENTAL SERVICES, INC.

1256-B West Brooks Street, Ontario, CA 91762
Tel: (909) 983-3848 Fax: (909) 983-3498

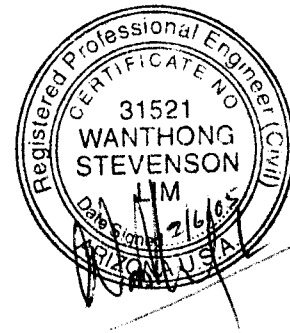
LSI PN: 2K502 Tank 105
Project Name: Romic Environmental Technologies Corporation
Project Location: ROMIC Southwest, Chandler, Arizona.

Issued: 12/10/02

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1	Scope of work, design loads and tank data	1
2	Seismic and wind analysis for overturning moment	2
3	Check existing support column, base plate and anchor bolts	3



SCOPE OF WORK:**Tank Designation:****105**

- Analyzed existing anchorage for 10'-0" Diameter by 13" high tank with (4) 3'-6" W8x31 legs.
- Overall top of tank elevation is 16'-10" with 10'-4" as center of tank for apply loads
- Check existing anchor bolts, base plate column and column connections.

DESIGN LOADS:**2000 International Building Code. 80 MPH wind, Seismic Use group II****WIND:**

$$F = Q_z * G * C_f * A_f$$

$$\text{Where } Q_z = 0.00256 K_z K_{zt} K_d V^2 I$$

$$Q_z = 0.00256 * 0.9 * 1.0 * 0.95 * 90^2 * 1.0 = 17.73 \text{ psf}$$

$$F_{\text{wnd}} = 2743 \text{ lbs.}$$

$$M_{\text{otm}} = F_{\text{wind}} * H_{\text{otm}} = 28332 \text{ lbs-ft}$$

H =	16.83	ft
D =	10	ft
K _z =	0.9	Tbl 6-3 Case2
K _{zt} =	1	Tbl 6-4 Flat
K _d =	0.95	Tbl 6-4
V =	90	MPH Fig 6-1
I =	1	Tbl 6-1
For H/D =	1.683	
C _f =	1.4	Tbl 6-19
G _f =	0.85	Sec 6.5.8
A _f =	130	Sq. Ft.
H _{otm} =	10.33	ft

Location: Chandler

State: Arizona

Siteclass: D

$$\text{From Fig. 1615(1): } S_s = 0.21 \text{ g}$$

$$\text{From Fig. 1615(2): } S_1 = 0.063 \text{ g}$$

$$S_{ds} = 0.67 F_a S_s = 0.224 \text{ W}$$

$$F_a = 1.6 \text{ Tbl 1615.1.2(1)}$$

$$R = 3 \text{ Tbl 1622.2.5(1)}$$

$$\text{Omega} = 2 \text{ Tbl 1622.2.5(1)}$$

$$I_e = 1.25 \text{ Tbl 1622.2.5(2)}$$

$$W = 86000 \text{ lbs}$$

$$V_{\text{seismic}} = C_s W \text{ Eq. 16-34}$$

$$= 0.093 W$$

$$C_s = S_{ds} / R * I = 0.0933$$

$$C_s \text{ min} = 0.044 S_{ds} I = 0.0123$$

$$\text{Use } C_s = 0.0933$$

$$T = 0.00000765 * (L / D)^2 * (wD / t)^{0.5} = 0.00000765 * (13./10)^2 * (46000/13*10/0.34)^{0.5}$$

$$= 0.000417 < 0.06 \text{ Rigid Structure}$$

$$V_{\text{simplified}} = 1.2 S_{ds} W / R = 0.090 W$$

$$V_{\text{nonstr}} = 0.14 S_{ds} I_e = 0.039 W$$

$$C_s \text{ min nonstr} = 0.8 S_1 I / R = 0.021 W$$

$$V_{\text{rigid nonstr}} = 0.3 S_{ds} I W = 0.084 W$$

$$\text{Use } V_s = 0.093 W$$

$$V_{\text{asd}} = 0.067 W$$

$$\text{Overturning Moment} = V_s W * 1.2 \text{ sloshing} * H_{\text{otm}} = 71070.4 \text{ lbs-ft} \quad \text{Seismic Control}$$

Check existing anchorage according to API 650 Appendix E - Seismic design of Storage Tanks

Given information:

Material: Carbon steel

Thickness: 0.34"

Concrete slab thickness: Min 6"

Full Tank +wt tank: 83700 lbs

Agitator: 500 lbs

Misc valves and structures: 1800 lbs

Seismic Analysis per API-650 Appendix E

Seismic zone, $Z =$ (Zone 4=0.4, zone 3=0.3, zone 2=0.2, zone 1=0.075)		0.40
Seismic Importance factor, $I_s =$ (Max $I = 1.5$, normally $I = 1.0$)		1.25
Site coefficient from soil type, $s =$ ($S_4=2$, $S_3=1.5$, $S_2=1.2$, $S_1=1.0$)		1.50
Specific gravity of liquid, $G =$		1.6
Tank diameter, $D =$		10.00 ft
Height of tank, $H_t =$		13.00 ft
Fill height from top of floor, $H =$		16.83 ft
Weight of content, $W_t =$		78.70 kips
Weight of shell, uncorroded, $W_s = .49 * (.34 / 12 * 2 * 22 / 7 * 5 * 13) =$	5.672333	5.672 kips
Weight of roof steel, uncorroded, $W_r' = .49 * .20 / 12 * 2 * 22 / 7 * 5 =$		0.244 kips
Roof equipment load in seismic, $W_e =$		0.50 kips
Ratio of $D / H =$		0.77
Weight of roof & equipment load, $W_r = W_r' + W_e =$		0.74 Kips
Height of center of gravity of shell, $X_s = H / 2 =$		8.42 ft
From Figure E-2 Effective masses, $W_1 / W_t =$	0.861	0.86
Contents in unison w/ shell, $W_1 = W_t * (W_1 / W_t) =$		67.76 Kips
From Figure E-2 Effective masses, $W_2 / W_t =$	0.195	0.20
First sloshing mode contents, $W_2 = W_t * (W_2 / W_t) =$		15.38 Kips
From Figure E-3 Centroids of seismic forces, $X_1 / H =$	0.428	0.43
Height to centroid, $X_1 = H * (X_1 / H) =$		7.20
From Figure E-3 Centroids of seismic forces, $X_2 / H =$	0.767	0.77
Height to centroid, $X_2 = H * (X_2 / H) =$		12.90
From Figure E-4 Factor k , $k =$	0.577	0.58
Natural period of first mode, $T = k * (D)^{0.5} =$		1.83 seconds
Lateral force coefficient, $C_1 = 0.24$		0.24
Lateral force coefficient, $C_2 = C_2 = 0.3S/T =$		0.25

Base shear $V_s = Z * I * (C_1 * (W_s + W_r + W_1) + C_2 * W_2) =$	10.80 Kips
Overturning, $M_{ot} = Z * I * (C_1 * W_s * X_s + C_1 * W_r * H_t + C_1 * W_1 * X_1 + C_2 * W_2 * X_2) =$	85.94 K-ft
Friction resistance from contents, shell, roof steel, $F_{fric} = 0.4 * (W_t + W_s + W_r) =$	33.85 Kips
Factor of safety for sliding, $FS_s = Fric / V_s =$	3.13 > 1.5 OK

Calculate resistance load against overturning:

Yield strength of tank material, $F_y =$	36.00 ksi
Thickness of bottom plate, $t_b = \max(t_f - c_o)$, thickness of floor or 0.25 =	1.00
Wt of contents allow for OT calc. per circumference, $W_L = 7.9 t_b (F_y G H)^{0.5} =$	7778.92 plf
Max allowable for $W_L = 1.25 G H D =$	336.66 plf
Use:	336.66 plf
Resistance to OT by contents, $P_r = 22/7 * D * W_L =$	10.58 Kips
Resistance to OT by shell and roof, $P_{sr} = W_s + W_r =$	6.42 Kips
Total resistance to OT moment, $M_r = (P_r + P_{sr}) * D / 2 =$	84.98 k-ft

Mot > Mr, Anchorage required**Wind analysis per API 650 section 3.11 Wind load on Tanks**

Based on 30 psf on vertical plane surface or 22 psf on projected area of cylindrical surface	
Wind pressure, $q_w =$	22.00 psf
Base shear from wind, $V_w = q_w * H_t * D =$	2.86 Kips
Overturning due to wind, $M_{otmw} = V_w * 10.33 =$	29.54 K-ft

Since Resistance to Overturning of tank < seismic or wind overturning, anchorage req'd.

Check existing support column, base plate and anchor bolts.

Overturning, $Mot = Z * I * (C1 * Ws * Xs + C1 * Wr * Ht + C1 * W1 * X1 + C2 * W2 * X2) =$ 85.94 k-ft
 Base shear $Vs = Z * I * (C1 * (Ws + Wr + W1) + C2 * W2) =$ 10.80 Kips

Shear along W8x31 column = 85.94 / 10 ft/2 cols = 4.30 Kips
 Capacity of existing 1/4 fillet weld at 24" each side = $0.928 * 4 * 2 * 24 =$ 178.18 Kips O.k.

Capacity of W8x31 for 1.5 ft in axial compression = (fr AISC 3-31)) = 178 Kips O.k.

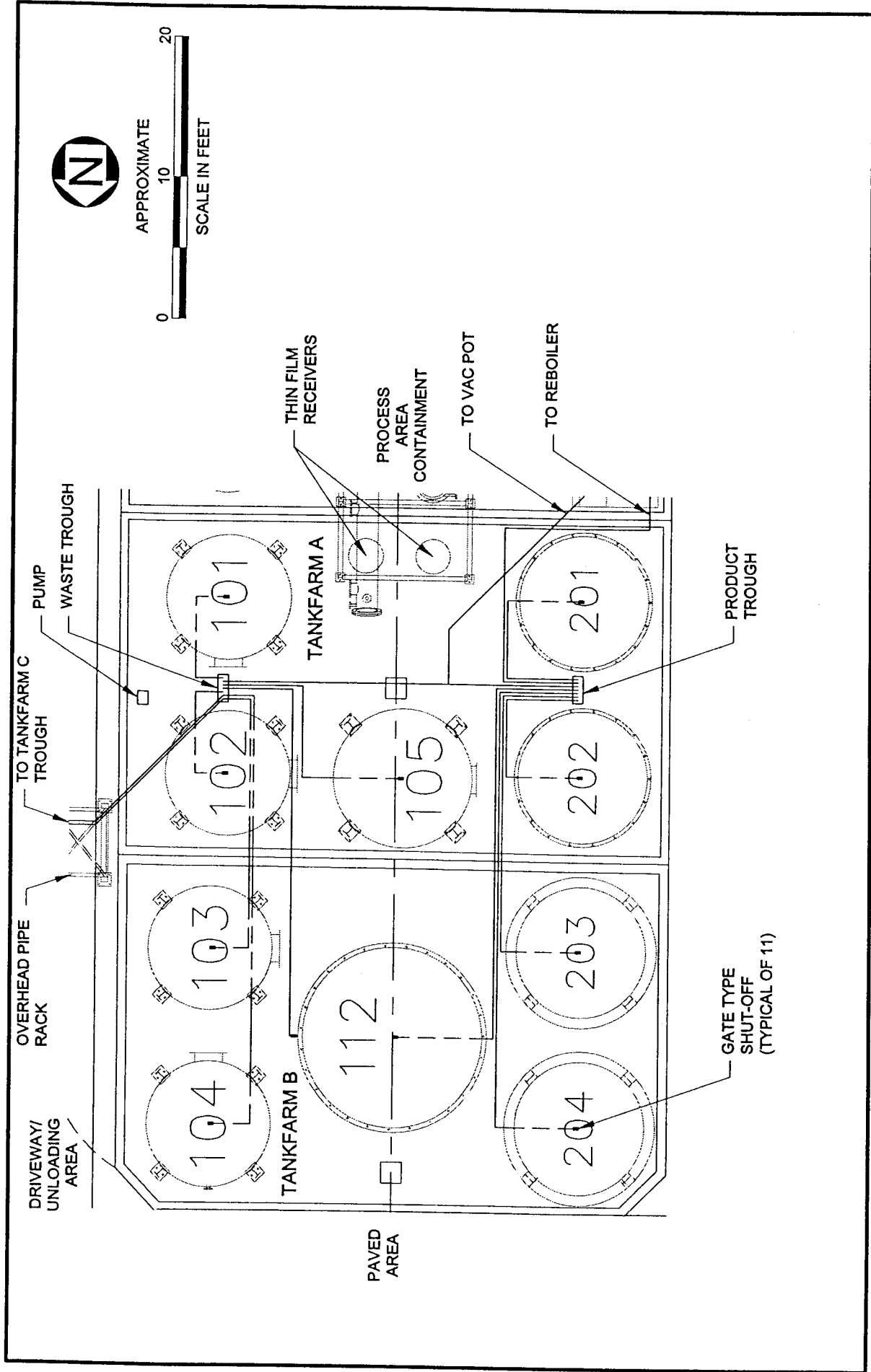
Tension load at (4) 1/2" diameter bolts = 4.3 / 4 bolts = 1.07 Kips
 Cap of pullout cone fr 4 bolts = $.55 * .65 * (22/7 * 10^2/4) * (3000)^{0.5} * 4/3 * 3 * 4 =$ 35.45 Kips O.k.

Check 1" x 12 x 12" base plate:

Fr ASIC 3-106: $n =$ 1.5 in. $m =$ 1.5 in. $Fy = .75 * 36 = 27$
 $fp = T * 2.2 / 12/12 =$ 0.066 ksi
 $t_{min} = 2m * (fp / Fy)^{0.5} =$ 0.15 in.
 $t_{min} = 2n * (fp / Fy)^{0.5} =$ 0.15 in. $1 > 0.16$ O.K.

Shear = $10.8 * 2.2 / 16 =$ 1.48 Kips $< Vall = 1.96 * 1.7 =$ 3.332 Kips

Therefore the existing (4) W8x31 support columns with 1"x12"x12" + (4) 1/2" diameter anchor bolts are still adequate to resist the overturning moment.



REFERENCE: BASEMAP PROVIDED BY:



Tankfarm A & B

Romic - Southwest
Chandler, Arizona

Figure D-6

Tank Certification Report

Tank T-112

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 7, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #112, a 15,000-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 15,000-gallon tank, (Tank #112), is constructed of stainless steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of carbon steel and stainless steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located in a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

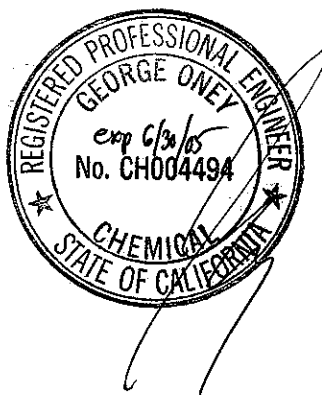
Estimated Remaining Service Life

The tank was installed in 1992. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-112

Weight: 6,600± lbs. Empty

Location: Tank Farm AB

181,700± lbs. Full

Service: Fuels/ Still Bottoms/ Solvents

Temp (°F) AMB.

Contents: Organic/aqueous

Pressure (Psig): ATM.

Size: 15,000 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: Stainless steel

Support: Skirt

Method of Construction: Welded

Insulation: n/a Agitator: 10 HP

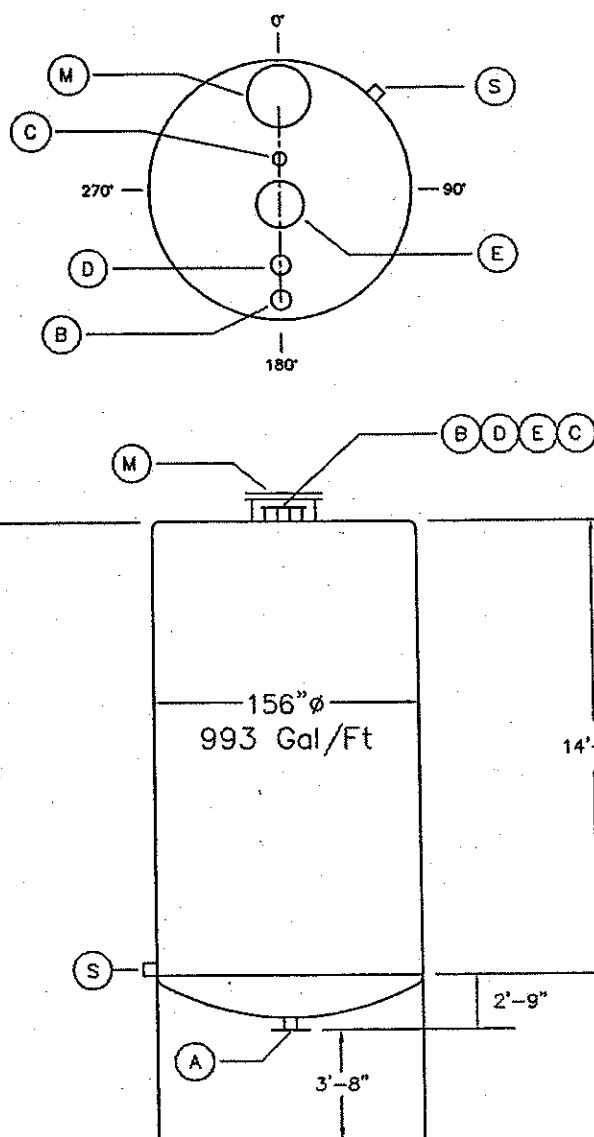
Other: Agitator w/ Baffles Optional

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard Flat top.
2. Flanged and dished bottom
3. Tank supported on ring skirt.
4. See Brown Tank & Steel W/O-3882.



Rev No.	Revision	By	Date	Apprvd	Date
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1	Update for 2001 Part B	RP	4-7-04	WK	4-04
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ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number Tk 112

METRO ENVIRONMENTAL SERVICES, INC.

1256-B West Brooks Street, Ontario, CA 91762
Tel: (909) 983-3848 Fax: (909) 983-3498

LSI PN: 2K502 Tank 112 and 113
Project Name: Romic Environmental Technologies Corporation
Project Location: ROMIC Southwest, Chandler, Arizona.

Issued: 01/31/05

Table of Contents:

Page No.

1	Scope of work, design loads and tank data	1
2	Seismic and wind analysis for overturning moment	2
3	Check anchorage.	3



SCOPE OF WORK:**Tank Designation: 112 and 113**

- Analyzed existing anchorage for 13'-0" Diameter by 14'-1" high tank with 6'-5" skirt
- Existing tank skirt w/1/2" thick 3" width bottom ring and (9) 3/4" diameter anchor bolts evenly spaced.
- Check existing anchorage.

DESIGN LOADS:**2000 International Building Code. 90 MPH wind, Seismic Use group II****WIND:** $F = Q_z * G * C_f * A_f$ Where $Q_z = 0.00256 K_z K_{zt} K_d V^2 I$

$$Q_z = 0.00256 * 0.9 * 1.0 * 0.95 * 90^2 * 1.0 = 17.73 \text{ psf}$$

$$F_{\text{wind}} = 2658 \text{ lbs.}$$

$$M_{\text{otm}} = F_{\text{wind}} * H_{\text{otm}} = 35777 \text{ lbs-ft}$$

H =	20.5	ft
D =	13	ft
K _z =	0.9	Tbl 6-3 Case2
K _{zt} =	1	Tbl 6-4 Flat
K _d =	0.95	Tbl 6-4
V =	90	MPH Fig 6-1
I =	1	Tbl 6-1
For H/D =	1.576923	
C _f =	1.4	Tbl 6-19
G _f =	0.85	Sec 6.5.8
A _f =	126	Sq. Ft.
H _{otm} =	13.4583	ft

Location: **Chandler**State: **Arizona**

Siteclass: D

$$\text{From Fig. 1615(1): } S_s = 0.21 \text{ g}$$

$$\text{From Fig. 1615(2): } S_1 = 0.063 \text{ g}$$

$$S_d s = 0.67 F_a S_s = 0.224 \text{ W}$$

$$V_{\text{seismic}} = C_s W \quad \text{Eq. 16-34}$$

$$= 0.093 W$$

$$F_a = 1.6 \text{ Tbl 1615.1.2(1)}$$

$$R = 3 \text{ Tbl 1622.2.5(1)}$$

$$\text{Omega} = 2 \text{ Tbl 1622.2.5(1)}$$

$$I_e = 1.25 \text{ Tbl 1622.2.5(2)}$$

$$W = 182000 \text{ lbs}$$

$$C_s = S_d s / R * I = 0.0933$$

$$C_s \text{ min} = 0.044 S_d s I = 0.0123$$

$$\text{Use } C_s = 0.0933$$

$$T = 0.00000765 * (L / D)^2 * (wD / t)^{0.5} = 0.000000765 * (14 / 13)^2 * (46000 / 14 * 13 / 0.34)^{0.5}$$

$$= 0.000314 < 0.06 \quad \text{Rigid Structure}$$

$$V_{\text{simplified}} = 1.2 S_d s W / R = 0.090 W$$

$$V_{\text{nonstr}} = 0.14 S_d s I_e = 0.039 W$$

$$C_s \text{ min nonstr} = 0.8 S_1 I / R = 0.021 W$$

$$V_{\text{s rigid nonstr}} = 0.3 S_d s I W = 0.084 W$$

$$\text{Use } V_s = 0.093 W$$

$$V_{\text{s asd}} = 0.067 W$$

$$\text{Overturning Moment} = V_s W * 1.2 \text{ sloshing} * H_{\text{otm}} = 195952.8 \text{ lbs-ft} \quad \text{Seismic Control}$$

Check existing anchorage according to API 650 Appendix E - Seismic design of Storage Tanks

Given information:

Material: Carbon steel
 Thickness: 0.34"
 Concrete slab thickness: Min 6"
 Full Tank +wt tank: 181700 lbs
 Agitator: 0 lbs
 Misc valves and structures: 300 lbs

Seismic Analysis per API-650 Appendix ESeismic zone, $Z =$ (Zone 4=0.4, zone 3=0.3, zone 2=0.2, zone 1=0.075)Seismic Importance factor, $I_s =$ (Max $I = 1.5$, normally $I = 1.0$)Site coefficient from soil type, $s =$ ($S_4=2$, $S_3=1.5$, $S_2=1.2$, $S_1=1.0$)Spacific gravity of liquid, $G =$ Tank diameter, $D =$ Height of tank, $H_t =$ Fill height from top of floor, $H =$ Weight of content, $W_t =$ Weight of shell, uncorroded, $W_s = .49 * (.34 / 12 * 2 * 22 / 7 * 6.5 * 14) = 7.988347$ Weight of roof steel, uncorroded, $W_r' = .49 * .20 / 12 * 2 * 22 / 7 * 4.5 =$ Roof equipment load in seismic, $W_e =$ Ratio of $D / H =$ Weight or roof & equipment load, $W_r = W_r' + W_e =$ Height of center of gravity of shell, $X_s = H / 2 =$ From Figure E-2 Effective masses, $W_1 / W_t = 0.890$ Contents in unison w/ shell, $W_1 = W_t * (W_1 / W_t) =$ From Figure E-2 Effective masses, $W_2 / W_t = 0.166$ First sloshing mode contents, $W_2 = W_t * (W_2 / W_t) =$ From Figure E-3 Centroids of seismic forces, $X_1 / H = 0.438$ Height to centroid, $X_1 = H * (X_1 / H) =$ From Figure E-3 Centroids of seismic forces, $X_2 / H = 0.797$ Height to centroid, $X_2 = H * (X_2 / H) =$ From Figure E-4 Factor k , $k = 0.578$ Natural period of first mode, $T = k * (D)^{0.5} =$ Lateral force coefficient, $C_1 = 0.24$ Lateral force coefficient, $C_2 = C_2 = 0.3S/T =$

0.40
1.25
1.50
1.4
9.00 ft
14.08 ft
20.50 ft
175.10 kips
7.988 kips
0.317 kips
0.30 kips
0.64
0.62 Kips
10.25 ft
0.89
155.80 Kips
0.17
29.03 Kips
0.44
8.99
0.80
16.34
0.58
1.73 seconds
0.24
0.26

Base shear $V_s = Z * I * (C_1 * (W_s + W_r + W_1) + C_2 * W_2) =$

23.50 Kips

Overturning, $Mot = Z * I * (C_1 * W_s * X_s + C_1 * W_r * H_t + C_1 * W_1 * X_1 + C_2 * W_2 * X_2) =$

213.61 K-ft

Friction resistance from contents, shell, roof steel, $F_{fric} = 0.4 * (W_t + W_s + W_r) =$

73.36 Kips

Factor of safety for sliding, $FS_s = Fric / V_s =$

3.12 > 1.5 OK

Calculate resistance load against overturning:Yield strength of tank material, $F_y =$

36.00 ksi

Thickness of bottom plate, $t_b = \max(t_f - c_o)$, thickness of floor or 0.25 =

6.000

Wt of contents allow for OT calc. per circumference, $W_L = 7.9 \text{ lb} (F_y G H)^{0.5} =$

48180.42 plf

Max allowable for $W_L = 1.25 G H D =$

322.875 plf

Use:

322.88 plf

Resistance to OT by contents, $P_r = 22/7 * D * W_L =$

9.13 Kips

Resistance to OT by shell and roof, $P_{sr} = W_s + W_r =$

8.61 Kips

Total resistance to OT moment, $M_r = (P_r + P_{sr}) * D / 2 =$

79.82 k-ft

Mot > Mr, Anchorage required**Wind analysis per API 650 section 3.11 Wind load on Tanks**

Based on 30 psf on vertical plane surface or 22 psf on projected area of cylindrical surface

Wind pressure, $q_w =$

22.00 psf

Base shear from wind, $V_w = q_w * H_t * D =$

4004.00 Kips

Overturning due to wind, $Mot_{mw} = V_w * 14/2 =$

53887.03 K-ft

Since Resistance to Overturning of tank < seismic or wind overturning, anchorage req'd.

Check existing (9) 3/4" diameter anchor bolts.

$$\text{Overturning, Mot} = Z * I * (C1 * Ws * Xs + C1 * Wr * Ht + C1 * W1 * X1 + C2 * W2 * X2) = 213.61 \text{ k-ft}$$

$$\text{Base shear Vs} = Z * I * (C1 * (Ws + Wr + W1) + C2 * W2) = 23.50 \text{ Kips}$$

Consider only four bolts are resisting overturning at one time.

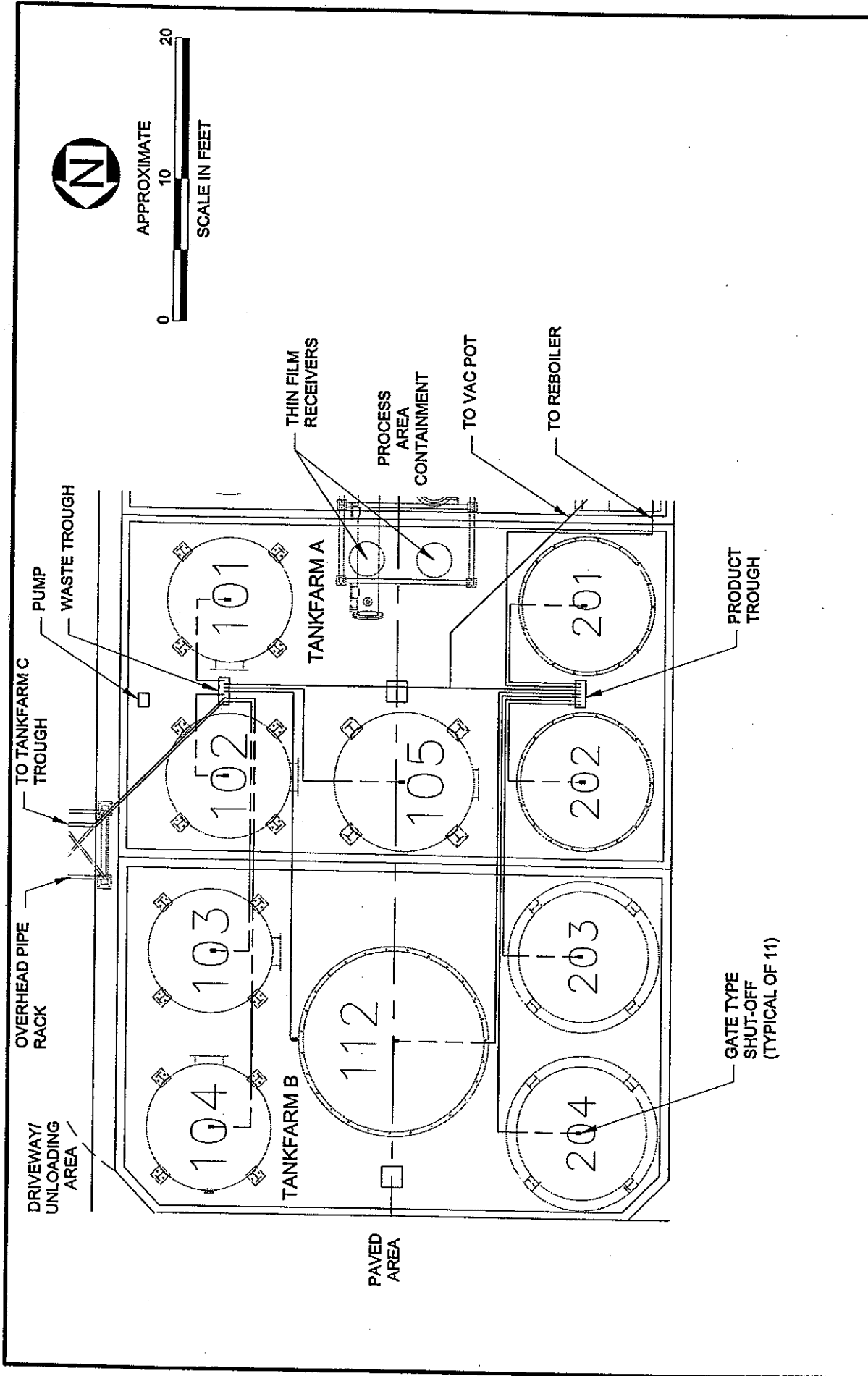
$$\text{Tension of one bolt} = 213.61 / 13 \text{ ft} / 4 \text{ bolts} = 4.11 \text{ Kips}$$

$$\text{Shear of one bolt} = 23.5 / 9 = 2.61 \text{ Kips}$$

$$\text{Combined stress of tension and shear} = (4.11/4.4)^{(5/3)} + (2.61/8.4)^{(5/3)} = 1.03 < 1.33$$

$$\text{Cap of pullout cone fr each bolt} = .55 * .65 * (22/7 * 10^2/4) * (3000)^{0.5 * 4/3 * 3 * 1} = 6.15 \text{ Kips O.k.}$$

Therefore the existing 9' diameter flat bottom tank with (9) 3/4" diameter bolt is still adequate to resist the overturning moment.



REFERENCE: BASEMAP PROVIDED BY:

ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Tankfarm A & B
Romic - Southwest
Chandler, Arizona

Figure D-6

P:\ROMIC\CADD\FIGURES\16463.DWG 02-14-05
XREF: P:\ROMIC\CADD\FIGURES\ROMIC-SITE.DWG

URS

Tank Certification Report

Tank T-113

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #113, a 15,000-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 15,000-gallon tank, (Tank #113), is constructed of stainless steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of carbon steel and stainless steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located in a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

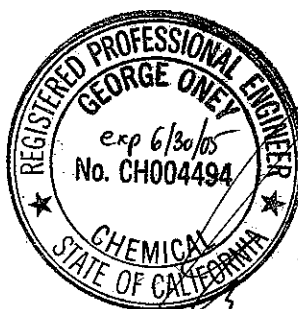
Estimated Remaining Service Life

The tank was installed in 1992. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-113

Weight: 6,600± lbs. Empty

Location: Tank Farm C

181,700± lbs. Full

Service: Fuels/ Still Bottoms/ Solvents

Temp (°F) AMB.

Contents: Organic/aqueous

Pressure (Psig): ATM.

Size: 15,000 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: Stainless steel

Support: Skirt

Method of Construction: Welded

Insulation: n/a Agitator: 10 HP

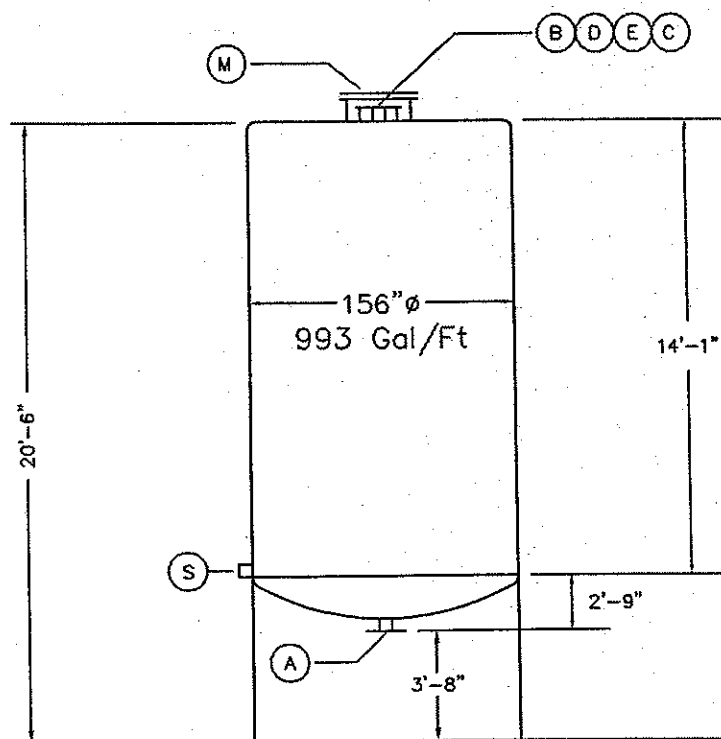
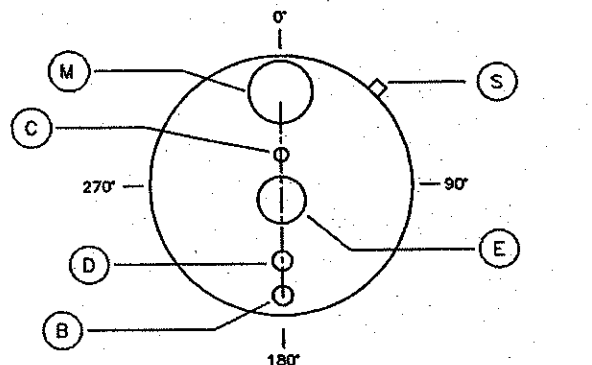
Other: Agitator w/ Baffles Optional

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard Flat top head
2. Flanged and dished bottom
3. Tank supported on ring skirt.
4. See Brown Tank & Steel W/O-3882.



Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2004 Part B	RP	4-7-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number Tk 113

METRO ENVIRONMENTAL SERVICES, INC.

1256-B West Brooks Street, Ontario, CA 91762
Tel: (909) 983-3848 Fax: (909) 983-3498

LSI PN: 2K502 Tank 112 and 113
Project Name: Romic Environmental Technologies Corporation
Project Location: ROMIC Southwest, Chandler, Arizona.

Issued: 01/31/05

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1	Scope of work, design loads and tank data	1
2	Seismic and wind analysis for overturning moment	2
3	Check anchorage.	3



SCOPE OF WORK:**Tank Designation: 112 and 113**

- Analyzed existing anchorage for 13'-0" Diameter by 14'-1" high tank with 6'-5" skirt
- Existing tank skirt w/1/2" thick 3" width bottom ring and (9) 3/4" diameter anchor bolts evenly spaced.
- Check existing anchorage.

DESIGN LOADS:**2000 International Building Code. 90 MPH wind, Seismic Use group II**

WIND: $F = Q_z * G * C_f * A_f$
 Where $Q_z = 0.00256 K_z K_{zt} K_d V^2 I$
 $Q_z = 0.00256 * 0.9 * 1.0 * 0.95 * 90^2 * 1.0 = 17.73 \text{ psf}$

$F_{\text{wnd}} = 2658 \text{ lbs.}$
 $M_{\text{otm}} = F_{\text{wind}} * H_{\text{otm}} = 35777 \text{ lbs-ft}$

H =	20.5	ft
D =	13	ft
K _z =	0.9	Tbl 6-3 Case2
K _{zt} =	1	Tbl 6-4 Flat
K _d =	0.95	Tbl 6-4
V =	90	MPH Fig 6-1
I =	1	Tbl 6-1
For H/D =	1.576923	
C _f =	1.4	Tbl 6-19
G _f =	0.85	Sec 6.5.8
A _f =	126	Sq. Ft.
H _{otm} =	13.4583	ft

Location: **Chandler** State: **Arizona**

From Fig. 1615(1): $S_s = 0.21 \text{ g}$
 From Fig. 1615(2): $S_1 = 0.063 \text{ g}$

$S_{ds} = 0.67 F_a S_s = 0.224 \text{ W}$

$V_{\text{seismic}} = C_s W \text{ Eq. 16-34}$
 $= 0.093 W$

Siteclass: D
 $F_a = 1.6 \text{ Tbl 1615.1.2(1)}$
 $R = 3 \text{ Tbl 1622.2.5(1)}$
 $\Omega = 2 \text{ Tbl 1622.2.5(1)}$
 $I_e = 1.25 \text{ Tbl 1622.2.5(2)}$
 $W = 182000 \text{ lbs}$

$C_s = S_{ds} / R * I = 0.0933$
 $C_{s \text{ min}} = 0.044 S_{ds} I = 0.0123$
 Use $C_s = 0.0933$

$T = 0.00000765 * (L / D)^2 * (wD / t)^{0.5} = 0.000000765 * (14./13)^2 * (46000/14*13/0.34)^{0.5}$
 $= 0.000314 < 0.06 \text{ Rigid Structure}$

$V_{\text{simplified}} = 1.2 S_{ds} W / R = 0.090 W$
 $V_{\text{nonstr}} = 0.14 S_{ds} I_e = 0.039 W$
 $C_{s \text{ min nonstr}} = 0.8 S_1 I / R = 0.021 W$
 $V_{\text{s rigid nonstr}} = 0.3 S_{ds} I W = 0.084 W$

Use $V_s = 0.093 W$
 $V_{s \text{ asd}} = 0.067 W$

Overturning Moment = $V_s W * 1.2 \text{ sloshing} * H_{\text{otm}} = 195952.8 \text{ lbs-ft}$ **Seismic Control**

Check existing anchorage according to API 650 Appendix E - Seismic design of Storage Tanks

Given information:

Material: Carbon steel
 Thickness: 0.34"
 Concrete slab thickness: Min 6"
 Full Tank +wt tank: 181700 lbs
 Agitator: 0 lbs
 Misc valves and structures: 300 lbs

Seismic Analysis per API-650 Appendix ESeismic zone, $Z =$ (Zone 4=0.4, zone 3=0.3, zone 2=0.2, zone 1=0.075)Seismic Importance factor, $I_s =$ (Max $I = 1.5$, normally $I = 1.0$)Site coefficient from soil type, $s =$ ($S_4=2$, $S_3=1.5$, $S_2=1.2$, $S_1=1.0$)Specific gravity of liquid, $G =$ Tank diameter, $D =$ Height of tank, $H_t =$ Fill height from top of floor, $H =$ Weight of content, $W_t =$ Weight of shell, uncorroded, $W_s = .49 * (.34 / 12 * 2 * 22 / 7 * 6.5 * 14) = 7.988347$ Weight of roof steel, uncorroded, $W_r' = .49 * .20 / 12 * 2 * 22 / 7 * 4.5 =$ Roof equipment load in seismic, $W_e =$ Ratio of $D / H =$ Weight of roof & equipment load, $W_r = W_r' + W_e =$ Height of center of gravity of shell, $X_s = H / 2 =$ From Figure E-2 Effective masses, $W_1 / W_t = 0.890$ Contents in unison w/ shell, $W_1 = W_t * (W_1 / W_t) =$ From Figure E-2 Effective masses, $W_2 / W_t = 0.166$ First sloshing mode contents, $W_2 = W_t * (W_2 / W_t) =$ From Figure E-3 Centroids of seismic forces, $X_1 / H = 0.438$ Height to centroid, $X_1 = H * (X_1 / H) =$ From Figure E-3 Centroids of seismic forces, $X_2 / H = 0.797$ Height to centroid, $X_2 = H * (X_2 / H) =$ From Figure E-4 Factor k , $k = 0.578$ Natural period of first mode, $T = k * (D)^{0.5} =$ Lateral force coefficient, $C_1 = 0.24$ Lateral force coefficient, $C_2 = C_2 = 0.3S/T =$

0.40
1.25
1.50
1.4
9.00 ft
14.08 ft
20.50 ft
175.10 kips
7.988 kips
0.317 kips
0.30 kips
0.64
0.62 Kips
10.25 ft
0.89
155.80 Kips
0.17
29.03 Kips
0.44
8.99
0.80
16.34
0.58
1.73 seconds
0.24
0.26

Base shear $V_s = Z * I * (C_1 * (W_s + W_r + W_1) + C_2 * W_2) =$

23.50 Kips

Overturning, $M_{ot} = Z * I * (C_1 * W_s * X_s + C_1 * W_r * H_t + C_1 * W_1 * X_1 + C_2 * W_2 * X_2) =$

213.61 K-ft

Friction resistance from contents, shell, roof steel, $F_{fric} = 0.4 * (W_t + W_s + W_r) =$

73.36 Kips

Factor of safety for sliding, $FS_s = F_{fric} / V_s =$

3.12 > 1.5 OK

Calculate resistance load against overturning:Yield strength of tank material, $F_y =$

36.00 ksi

Thickness of bottom plate, $t_b = \max(t_f - c_o)$, thickness of floor or 0.25 =

6.000

Wt of contents allow for OT calc. per circumference, $W_L = 7.9 \text{ lb} (F_y G H)^{0.5} =$

48180.42 plf

Max allowable for $W_L = 1.25 G H D = 322.875 \text{ plf}$

Use:

322.88 plf

Resistance to OT by contents, $P_r = 22/7 * D * W_L =$

9.13 Kips

Resistance to OT by shell and roof, $P_{sr} = W_s + W_r =$

8.61 Kips

Total resistance to OT moment, $M_r = (P_r + P_{sr}) * D / 2 =$

79.82 k-ft

Mot > Mr, Anchorage required**Wind analysis per API 650 section 3.11 Wind load on Tanks**

Based on 30 psf on vertical plane surface or 22 psf on projected area of cylindrical surface

Wind pressure, $q_w =$

22.00 psf

Base shear from wind, $V_w = q_w * H_t * D =$

4004.00 Kips

Overturning due to wind, $M_{otmw} = V_w * 14/2 =$

53887.03 K-ft

Since Resistance to Overturning of tank < seismic or wind overturning, anchorage req'd.

Check existing (9) 3/4" diameter anchor bolts.

$$\begin{aligned} \text{Overturning, } M_o &= Z * I * (C1 * W_s * X_s + C1 * W_r * H_t + C1 * W1 * X1 + C2 * W2 * X2) = & 213.61 \text{ k-ft} \\ \text{Base shear } V_s &= Z * I * (C1 * (W_s + W_r + W1) + C2 * W2) = & 23.50 \text{ Kips} \end{aligned}$$

Consider only four bolts are resisting overturning at one time.

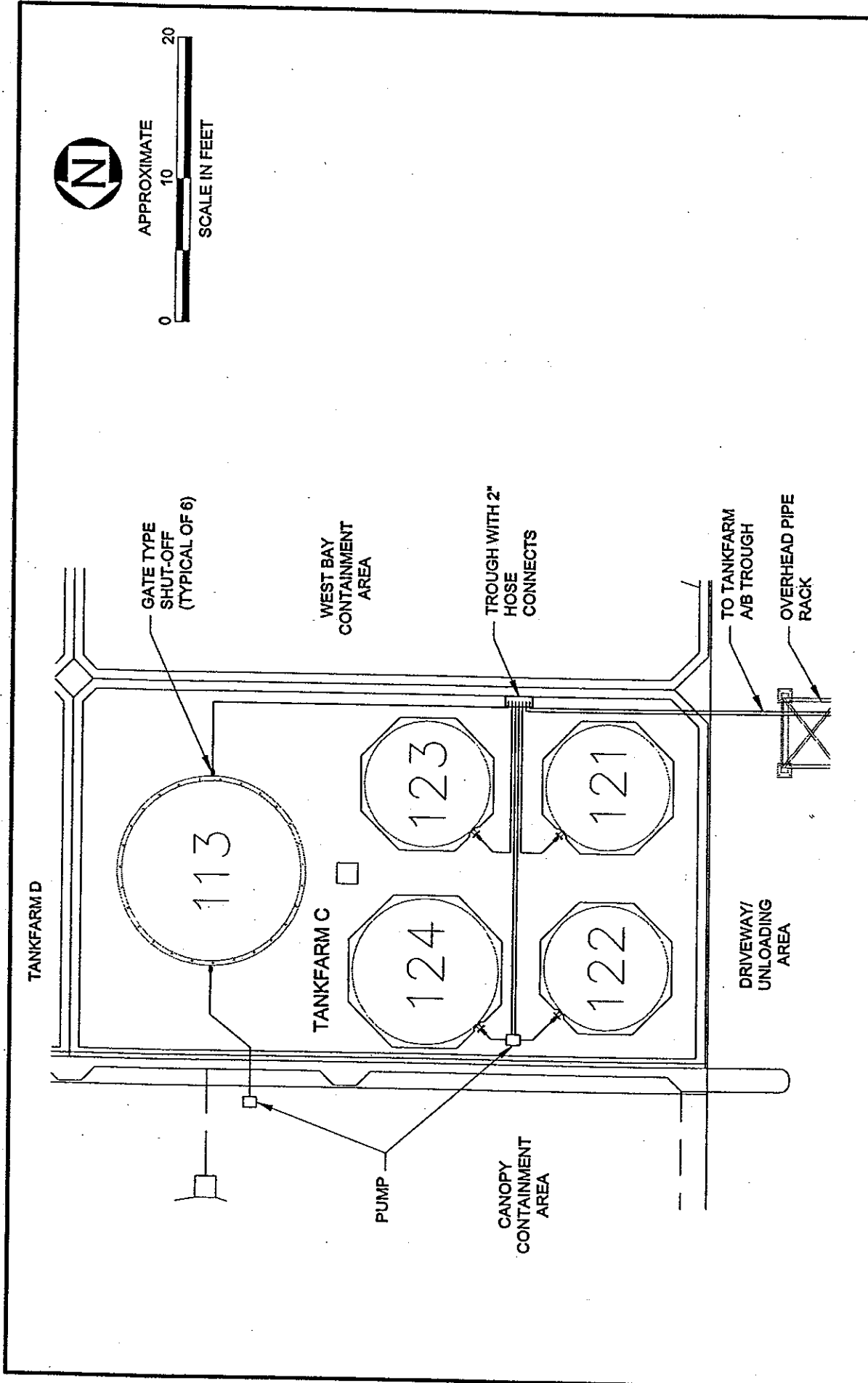
$$\text{Tension of one bolt} = 213.61 / 13 \text{ ft} / 4 \text{ bolts} = 4.11 \text{ Kips}$$

$$\text{Shear of one bolt} = 23.5 / 9 = 2.61 \text{ Kips}$$

$$\text{Combined stress of tension and shear} = (4.11/4.4)^{(5/3)} + (2.61/8.4)^{(5/3)} = 1.03 < 1.33$$

$$\text{Cap of pullout cone fr each bolt} = .55 * .65 * (22/7 * 10^2/4) * (3000)^{0.5} * 4/3 * 3 * 1 = 6.15 \text{ Kips O.k.}$$

Therefore the existing 9' diameter flat bottom tank with (9) 3/4" diameter bolt is still adequate to resist the overturning moment.



REFERENCE: BASEMAP PROVIDED BY:

ROMIC
 ENVIRONMENTAL TECHNOLOGIES CORP.
 ROMIC SOUTHWEST, CHANDLER, ARIZONA

Tankfarm C
 Romic - Southwest
 Chandler, Arizona
 Figure D-7

URS

P:\ROMIC\CADD\FIGURES\16454.DWG 02-14-05
 XREF: P:\ROMIC\CADD\FIGURES\ROMIC-SITE.DWG

Tank Certification Report

Tank T-121

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 7, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #121, a 6,500-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 6,500-gallon tank, (Tank #121), is constructed of carbon steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of carbon steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located in a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

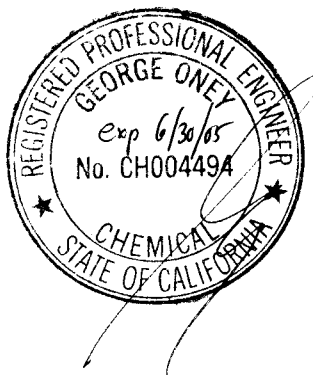
Estimated Remaining Service Life

The tank was installed in 1992. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494



INTRODUCTION

On May 27, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of the anchorage system for Tank #121, a 6,500-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

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George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494



Tank Certification Report

Tank T-122

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On May 27, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #122, a 6,500-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 6,500-gallon tank, (Tank #122), is constructed of carbon steel. Please refer to the attached Tank Specification Sheet for tank details.

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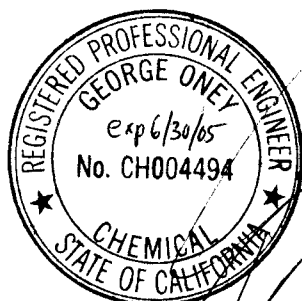
Estimated Remaining Service Life

The tank was installed in 1992. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

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ASSESSMENT ITEMS

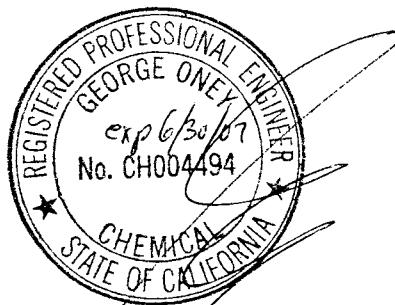
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George A. Oney, P.E.
Chemical Engineer
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Tank Certification Report

Tank T-123

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 2, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #123, a 6,500-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

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Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

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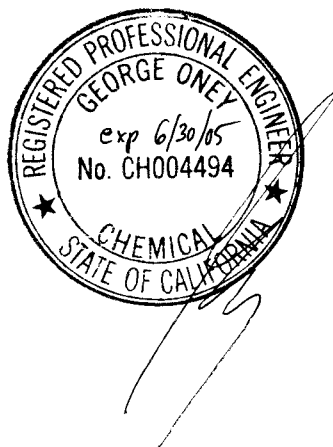
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Chemical Engineer
Registration No. CH004494



INTRODUCTION

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ASSESSMENT ITEMS

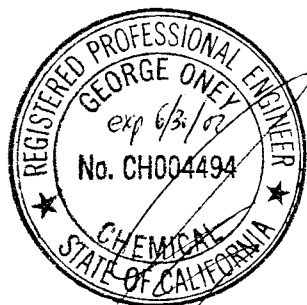
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George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-121 to TK-123

Weight: 4,000± lbs. Empty

Location: Tank Farm C

80,000± lbs. Full

Service: Waste Storage

Temp (°F) AMB.

Contents: Organic/aqueous

Pressure (Psig): ATM.

Size: 6,500 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: Carbon Steel

Support: Flat Bottom

Method of Construction: Welded

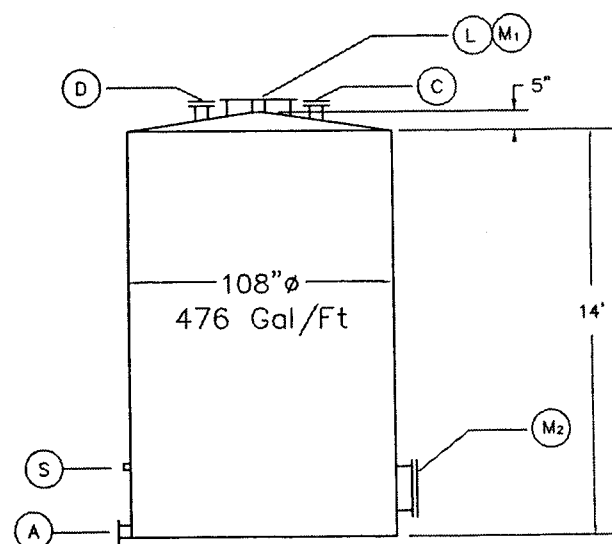
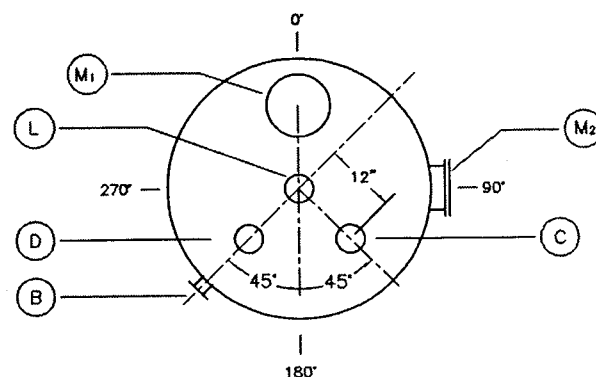
Insulation: n/a Agitator: n/a

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard cone top
2. Flat bottom



Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2004 Part B	RP	4-7-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number TK-121 to TK-123

METRO ENVIRONMENTAL SERVICES, INC.

1256-B West Brooks Street, Ontario, CA 91762
Tel: (909) 983-3848 Fax: (909) 983-3498

LSI PN: 2K502 Tank 121, 122 and 123
Project Name: Romic Environmental Technologies Corporation
Project Location: ROMIC Southwest, Chandler, Arizona.

Issued: 01/31/05

Table of Contents:

Page No.

1	Scope of work, design loads and tank data	1
2	Seismic and wind analysis for overturning moment	2
3	Check existing anchorage	3



SCOPE OF WORK:**Tank Designation:** Tank 121, 122 and 123

- Analyzed existing anchorage for 9' Diameter by 14" high tank flat bottom tank
- Existing tank with (4)L4x4x3/8, each with (1) 3/4" diameter anchor bolt
- Check existing anchorage.

DESIGN LOADS:**2000 International Building Code. 80 MPH wind, Seismic Use group II****WIND:** $F = Q_z * G * C_f * A_f$ Where $Q_z = 0.00256 K_z K_{zt} K_d V^2 I$

$$Q_z = 0.00256 * 0.9 * 1.0 * 0.95 * 90^2 * 1.0 = 17.73 \text{ psf}$$

$$F_{\text{wind}} = 2743 \text{ lbs.}$$

$$M_{\text{otm}} = F_{\text{wind}} * H_{\text{otm}} = 19199 \text{ lbs-ft}$$

H =	14.5	ft
D =	9	ft
K _z =	0.9	Tbl 6-3 Case2
K _{zt} =	1	Tbl 6-4 Flat
K _d =	0.95	Tbl 6-4
V =	90	MPH Fig 6-1
I =	1	Tbl 6-1
For H/D =	1.61	
C _f =	1.4	Tbl 6-19
G _f =	0.85	Sec 6.5.8
A _f =	130	Sq. Ft.
H _{otm} =	7	ft

Location: Chandler State: Arizona

Siteclass: D

$$\text{From Fig. 1615(1): } S_s = 0.21 \text{ g}$$

$$\text{From Fig. 1615(2): } S_1 = 0.063 \text{ g}$$

$$S_{ds} = 0.67 F_a S_s = 0.224 W$$

$$F_a = 1.6 \text{ Tbl 1615.1.2(1)}$$

$$R = 3 \text{ Tbl 1622.2.5(1)}$$

$$\text{Omega} = 2 \text{ Tbl 1622.2.5(1)}$$

$$I_e = 1.25 \text{ Tbl 1622.2.5(2)}$$

$$W = 81000 \text{ lbs}$$

$$V_{\text{seismic}} = C_s W \quad \text{Eq. 16-34}$$

$$= 0.093 W$$

$$C_s = S_{ds} / R * I_e = 0.0933$$

$$C_{s \text{ min}} = 0.044 S_{ds} I_e = 0.0123$$

$$\text{Use } C_s = 0.0933$$

$$T = 0.00000765 * (L / D)^2 * (wD / t)^{0.5} = 0.00000765 * (14./9)^2 * (46000/14*9/0.34)^{0.5}$$

$$= 0.000546 < 0.06 \quad \text{Rigid Structure}$$

$$V_{\text{simplified}} = 1.2 S_{ds} W / R = 0.090 W$$

$$V_{\text{nonstr}} = 0.14 S_{ds} I_e = 0.039 W$$

$$C_{s \text{ min nonstr}} = 0.8 S_1 I_e / R = 0.021 W$$

$$V_{\text{s rigid nonstr}} = 0.3 S_{ds} I_e W = 0.084 W$$

$$\text{Use } V_s = 0.093 W$$

$$V_{s \text{ asd}} = 0.067 W$$

$$\text{Overturning Moment} = V_s W * 1.2 \text{ sloshing} * H_{\text{otm}} = 45360 \text{ lbs-ft} \quad \text{Seismic Control}$$

Check existing anchorage according to API 650 Appendix E - Seismic design of Storage Tanks

Given information:

Material: Carbon steel
 Thickness: 0.34"
 Concrete slab thickness: Min 6"
 Full Tank +wt tank: 80000 lbs
 Agitator: 0 lbs
 Misc valves and structures: 1000 lbs

Seismic Analysis per API-650 Appendix ESeismic zone, $Z =$ (Zone 4=0.4, zone 3=0.3, zone 2=0.2, zone 1=0.075)Seismic Importance factor, $I_s =$ (Max $I = 1.5$, normally $I = 1.0$)Site coefficient from soil type, $s =$ ($S_4=2$, $S_3=1.5$, $S_2=1.2$, $S_1=1.0$)Spacific gravity of liquid, $G =$ Tank diameter, $D =$ Height of tank, $H_t =$ Fill height from top of floor, $H =$ Weight of content, $W_t =$ Weight of shell, uncorroded, $W_s = .49 * (.34 / 12 * 2 * 22 / 7 * 4.5 * 14) = 5.4978$ Weight of roof steel, uncorroded, $W_r' = .49 * .20 / 12 * 2 * 22 / 7 * 4.5 =$ Roof equipment load in seismic, $W_e =$ Ratio of $D / H =$ Weight or roof & equipment load, $W_r = W_r' + W_e =$ Height of center of gravity of shell, $X_s = H / 2 =$ From Figure E-2 Effective masses, $W_1 / W_t = 0.889$ Contents in unison w/ shell, $W_1 = W_t * (W_1 / W_t) =$ From Figure E-2 Effective masses, $W_2 / W_t = 0.167$ First sloshing mode contents, $W_2 = W_t * (W_2 / W_t) =$ From Figure E-3 Centroids of seismic forces, $X_1 / H = 0.438$ Height to centroid, $X_1 = H * (X_1 / H) =$ From Figure E-3 Centroids of seismic forces, $X_2 / H = 0.796$ Height to centroid, $X_2 = H * (X_2 / H) =$ From Figure E-4 Factor k , $k = 0.578$ Natural period of first mode, $T = k * (D)^{0.5} =$ Lateral force coefficient, $C_1 = 0.24$ Lateral force coefficient, $C_2 = C_2 = 0.3S/T =$

0.40
1.25
1.50
1.4
9.00 ft
14.00 ft
14.00 ft
80.00 kips
5.498 kips
0.256 kips
1.00 kips
0.64
1.26 Kips
7.00 ft
0.89
71.12 Kips
0.17
13.33 Kips
0.44
6.13
0.80
11.14
0.58
1.73 seconds
0.24
0.26

Base shear $V_s = Z * I * (C_1 * (W_s + W_r + W_1) + C_2 * W_2) =$ Overturning, $M_{ot} = Z * I * (C_1 * W_s * X_s + C_1 * W_r * H_t + C_1 * W_1 * X_1 + C_2 * W_2 * X_2) =$ Friction resistance from contents, shell, roof steel, $F_{fric} = 0.4 * (W_t + W_s + W_r') =$ Factor of safety for sliding, $F_{Ss} = F_{ric} / V_s =$

11.08 Kips
75.22 K-ft
 34.30 Kips
3.10 > 1.5 OK

Calculate resistance load against overturning:Yield strength of tank material, $F_y =$ Thickness of bottom plate, $t_b = \max(t_f - c_o)$, thickness of floor or 0.25 =Wt of contents allow for OT calc. per circumference, $W_L = 7.9 t_b (F_y / G H)^{0.5} =$ Max allowable for $W_L = 1.25 G H D = 220.5$ plf

Use:

Resistance to OT by contents, $P_r = 22/7 * D * W_L =$ Resistance to OT by shell and roof, $P_{sr} = W_s + W_r =$ Total resistance to OT moment, $M_r = (P_r + P_{sr}) * D / 2 =$ **Mot > Mr, Anchorage required**

36.00 ksi
6.00
39816.00 plf
220.50 plf
6.24 Kips
6.75 Kips
58.46 k-ft

Wind analysis per API 650 section 3.11 Wind load on Tanks

Based on 30 psf on vertical plane surface or 22 psf on projected area of cylindrical surface

Wind pressure, $q_w =$ Base shear from wind, $V_w = q_w * H_t * D =$ Overturning due to wind, $M_{otmw} = V_w * 14/2 =$

22.00 psf
2.77 Kips
19.40 K-ft

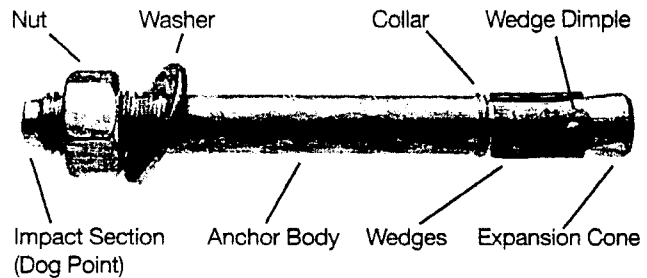
Since Resistance to Overturning of tank < seismic or wind overturning, anchorage req'd.

Kwik Bolt II Expansion Anchor

4.3.3

4.3.3.1 PRODUCT DESCRIPTION

The Kwik Bolt II is a stud type expansion anchor with a single piece wedge that performs as three independent wedges if necessary to provide consistent performance in a wide variety of medium-duty applications. Applicable base materials include concrete, lightweight concrete and grout-filled block.



Product Features

- Impact section (Dog Point) prevents thread damage during installation
- Independent 3-piece wedge with dimples help prevent anchor from spinning during installation
- Length identification code facilitates quality control & inspection after installation
- Anchor size is same as drill bit size for easy installation
- Comprehensive performance testing to provide high & consistent performance in concrete, light-weight concrete & grout filled block base materials
- Mechanical expansion allows immediate load application
- Can be installed in bottomless hole, which allows the anchor to be driven flush with the surface after use. Eliminates cutting bolt heads.
- Can be installed through the fixture, improving productivity
- Comprehensive product offering includes many head styles, sizes, carbon steel and stainless steel materials for a variety of applications

Guide Specifications

Expansion Anchors	Expansion anchors shall be stud type with a single piece three section wedge and zinc plated in accordance with ASTM B633. The anchors must meet the description in Federal Specification FF-S-325, Group II, Type 4, Class I for concrete expansion anchors. Anchors shall be Hilti Kwik Bolt II as supplied by Hilti, Inc., P.O. Box 21148, Tulsa, OK 74121.
Installation	Anchors to be installed in holes drilled with Hilti carbide tipped drill bits or matched tolerance diamond core bits. Anchors shall be installed per manufacturer's recommendations.

Listings/Approvals

- Underwriters Laboratory No. 203 "Pipe Hangers" (3/8"-3/4" diameters)
- International Conference of Building Officials (ICBO ES): Evaluation Report No. 4627, KB II
- International Conference of Building Officials (ICBO ES): Evaluation Report No. 5224, HCKB
- Southern Building Code Congress (SBCCI): Report No. 9930
- City of Los Angeles (COLA): Research Report No. 24946
- Conforms to the description in Federal Specification FF-S-325, Group II, Type 4, Class I
- Factory Mutual (FM) KB II 3/8" x 2 1/4" w/Rod Coupler
- Metro-Dade County Approval 98-0901.13

4.3.3.2 MATERIAL SPECIFICATIONS

Carbon Steel KB II studs conform to ASTM A510 with chemical composition of AISI 1038 except countersunk KB II, KB 3/4" x 12", KB II 1" x 6", KB II 1" x 9" and KB II 1" x 12" which conform to ASTM A108 with chemical composition of AISI 11L41

Wedges are manufactured from AISI 1010 carbon steel, except KB II 3/4" x 12", KB II 1" x 6", KB II 1" x 9" and KB II 1" x 12" wedges which conform to chemical composition of AISI 304

Nuts are carbon steel conforming to ASTM A563 Grade A and meet dimensional requirements of ANSI B18.2.2

Washers are carbon steel conforming to SAE 1005-1033 and meet dimensional requirements of ANSI 18.22.1 Type A Plain

All carbon steel parts are zinc plated in accordance with ASTM B633, Type III Fe/Zn 5

Stainless Steel KB II studs conform to ASTM A276 or ASTM A493 with chemical composition of either AISI 304 or 316 1/4" thru 9/16" over 9/16"

Stainless steel wedges are of the same material grade as bolts or superior.

Nuts are stainless steel conforming to ASTM F594 with chemical composition of either AISI 304 or 316 and meeting dimensional requirements of ANSI B18.2.2 to conform with stud material

Washers are AISI 304 or 316 stainless steel conforming to ASTM A240 to conform with stud material

Note: Special Order KB II's, nuts and washers may vary from standard materials.

MECHANICAL PROPERTIES	
f_y ksi (MPa)	min. f_u ksi (MPa)
41 (282)	75 (517)
75 (517)	90 (620)
N/A	N/A
N/A	N/A
N/A	N/A
76 (524)	90 (620)
64 (441)	76 (524)

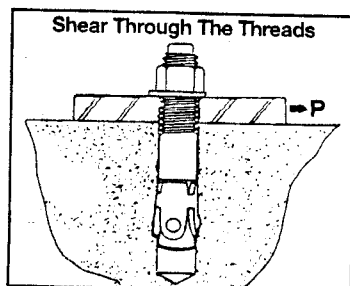
Kwik Bolt II Expansion Anchor

4.3.3

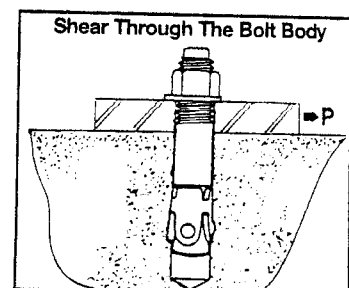
Carbon Steel Kwik Bolt II Allowable Loads in Concrete

Anchor Diameter in. (mm)	Embedment Depth in. (mm)	2000 psi (13.8 MPa)		3000 psi (20.7 MPa)		4000 psi (27.6 MPa)		6000 psi (41.4 MPa)	
		Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
$\frac{1}{4}$ (6.4)	$1\frac{1}{8}$ (29)	270 (1.2)	430 (1.9)	330 (1.5)	430 (1.9)	380 (1.7)	430 (1.9)	470 (2.1)	430 (1.9)
	2* (51)	560 (2.5)	530 (2.4)	590 (2.6)	530 (2.4)	630 (2.8)	530 (2.4)	670 (3.0)	530 (2.4)
	$3\frac{3}{4}$ * (95)	670 (3.0)		670 (3.0)		670 (3.0)			
$\frac{3}{8}$ (9.5)	$1\frac{1}{8}$ (41)	530 (2.4)	990 (4.4)	650 (2.9)	1040 (4.6)	750 (3.3)	1100 (4.9)	850 (3.8)	1100 (4.9)
	$2\frac{1}{2}$ * (64)	1200 (5.3)	1470 (6.5)	1290 (5.7)	1470 (6.5)	1370 (6.1)	1470 (6.5)	1550 (6.9)	1470 (6.5)
	$4\frac{1}{4}$ * (108)	1330 (5.9)		1390 (6.2)		1440 (6.4)			
$\frac{1}{2}$ (12.7)	$2\frac{1}{4}$ (57)	1170 (5.2)	1940 (8.6)	1310 (5.8)	1970 (8.8)	1450 (6.4)	1970 (8.8)	1730 (7.7)	1970 (8.8)
	$3\frac{1}{2}$ * (89)	1870 (8.3)	2450 (10.9)	2130 (9.5)	2450 (10.9)	2400 (10.7)	2450 (10.9)	2800 (12.5)	2450 (10.9)
	6* (152)	2080 (9.3)		2310 (10.3)		2530 (11.3)			
$\frac{5}{8}$ (15.9)	$2\frac{3}{4}$ (70)	1600 (7.1)	3070 (13.7)	1870 (8.3)	3070 (13.7)	2130 (9.5)	3070 (13.7)	2670 (11.9)	3070 (13.7)
	4** (102)	2400 (10.7)	3840 (17.1)	2850 (12.7)	3840 (17.1)	3290 (14.6)	3840 (17.1)	4190 (18.6)	3840 (17.1)
	7** (178)	3200 (14.2)		3470 (15.4)		3730 (16.6)			
$\frac{3}{4}$ (19.1)	$3\frac{1}{4}$ (83)	1970 (8.8)	4140 (18.4)	2320 (10.3)	4140 (18.4)	2670 (11.9)	4140 (18.4)	3200 (14.2)	4140 (18.4)
	$4\frac{3}{4}$ ** (121)	2930 (13.0)	5120 (22.8)	4130 (18.4)	5120 (22.8)	4800 (21.4)	5120 (22.8)	5870 (26.1)	5120 (22.8)
	8** (203)	4000 (17.8)		4930 (21.9)		5870 (26.1)		6320 (28.1)	
1 (25.4)	$4\frac{1}{2}$ (114)	3330 (14.8)	7070 (31.4)	4050 (18.0)	7600 (33.8)	4670 (20.8)	8140 (36.2)	5070 (22.6)	9200 (40.9)
	6 (152)	4930 (21.9)	9200 (40.9)	6000 (26.7)	9200 (40.9)	7070 (31.4)	9200 (40.9)	8400 (37.4)	
	9 (229)	6670 (29.7)		7670 (34.1)		8670 (38.6)		10670 (47.5)	

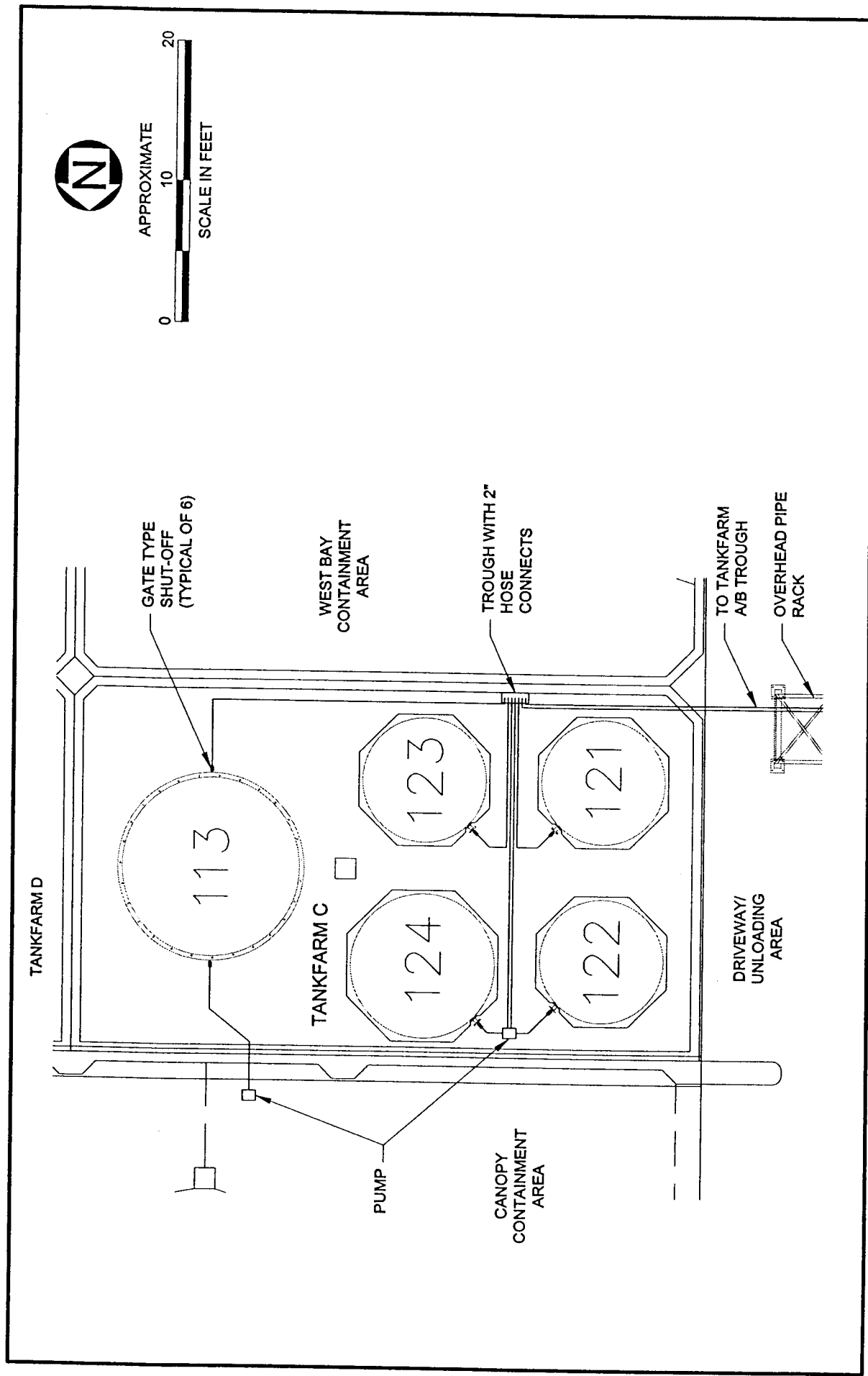
* Values shown are for a shear plane acting through the anchor bolt body. When the shear plane is acting through the anchor bolt threads, reduce the shear values by 20%.



** Values shown are for a shear plane acting through the anchor bolt body. When the shear plane is acting through the anchor bolt threads, reduce the shear value by 12%.



All other values shown are for shear plane acting through either body or threads.



REFERENCE: BASEMAP PROVIDED BY:

ROMIC
 ENVIRONMENTAL TECHNOLOGIES CORP.
 ROMIC SOUTHWEST, CHANDLER, ARIZONA



Tankfarm C
 Romic - Southwest
 Chandler, Arizona
 Figure D-7

Tank Certification Report

Tank T-124

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #124, a 9,000-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is organic and/or aqueous hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 9,000-gallon tank, (Tank #124), is constructed of carbon steel. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of carbon steel. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located in a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

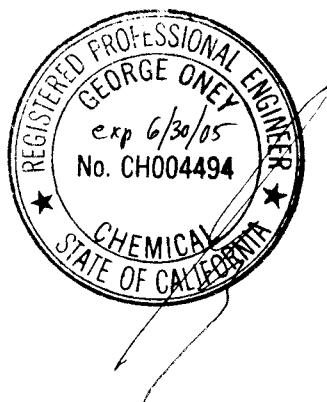
Estimated Remaining Service Life

The tank was installed in 1992. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494



INTRODUCTION

On May 27, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of the anchorage system for Tank #124, a 9,000-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

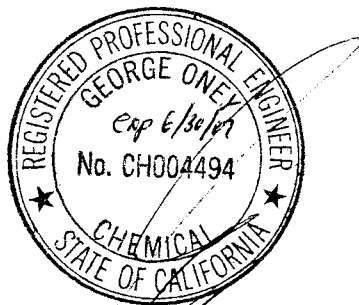
Tank Anchorage System Installation Inspection

The tank anchorage system was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate installation. No discrepancies were noted.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-124

Weight: 4,900± lbs. Empty

Location: Tank Farm C

110,000± lbs. Full

Service: Waste Storage

Temp (°F) AMB.

Contents: Organic/aqueous

Pressure (Psig): ATM.

Size: 9,000 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: Carbon Steel

Support: Flat Bottom

Method of Construction: Welded

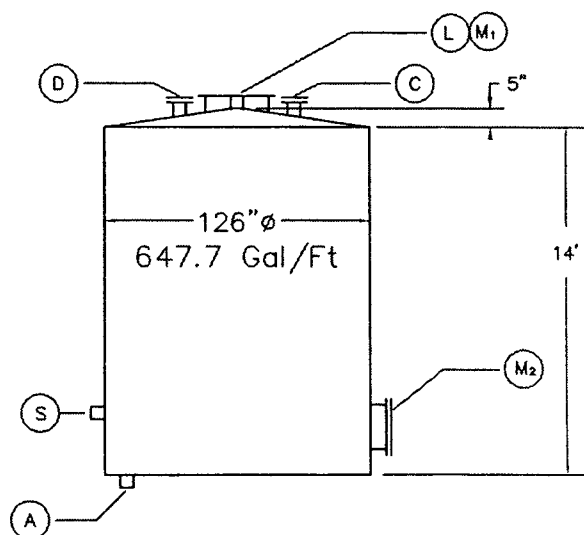
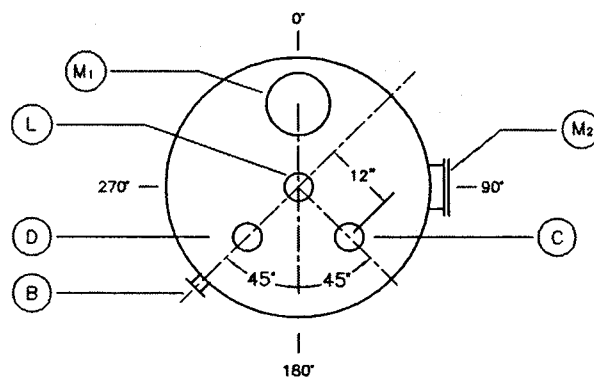
Insulation: n/a Agitator: n/a

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard cone top
2. Flat bottom



Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2004 Part B	RP	4-7-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number Tk 124

METRO ENVIRONMENTAL SERVICES, INC.

1256-B West Brooks Street, Ontario, CA 91762
Tel: (909) 983-3848 Fax: (909) 983-3498

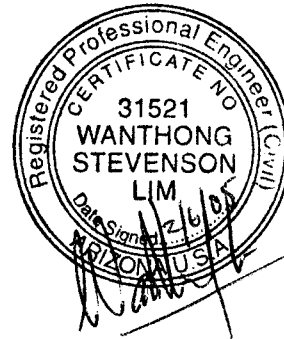
LSI PN: 2K502 Tank 124
Project Name: Romic Environmental Technologies Corporation
Project Location: ROMIC Southwest, Chandler, Arizona.

Issued: 01/31/05

Table of Contents:

Page No.

1	Scope of work, design loads and tank data	1
2	Seismic and wind analysis for overturning moment	2
3	Check existing anchorage	3



SCOPE OF WORK:**Tank Designation:** Tank 124

- Analyzed existing anchorage for 10'-6" Diameter by 14" high tank flat bottom tank
- Existing tank with (4)L4x4x3/8, each with (1) 3/4" diameter anchor bolt
- Check existing anchorage.

DESIGN LOADS:**2000 International Building Code. 80 MPH wind, Seismic Use group II**

WIND: $F = Q_z * G * C_f * A_f$
 Where $Q_z = 0.00256 K_z K_{zt} K_d V^2 I$
 $Q_z = 0.00256 * 0.9 * 1.0 * 0.95 * 90^2 * 1.0 = 17.73 \text{ psf}$

$$F_{\text{wnd}} = 2743 \text{ lbs.}$$

$$M_{\text{otm}} = F_{\text{wind}} * H_{\text{otm}} = 19199 \text{ lbs-ft}$$

H =	14.5	ft
D =	10.5	ft
K _z =	0.9	Tbl 6-3 Case2
K _{zt} =	1	Tbl 6-4 Flat
K _d =	0.95	Tbl 6-4
V =	90	MPH Fig 6-1
I =	1	Tbl 6-1
For H/D =	1.38	
C _f =	1.4	Tbl 6-19
G _f =	0.85	Sec 6.5.8
A _f =	130	Sq. Ft.
H _{otm} =	7	ft

Location: Chandler State: Arizona

Siteclass: D

$$\text{From Fig. 1615(1): } S_s = 0.21 \text{ g}$$

$$\text{From Fig. 1615(2): } S_1 = 0.063 \text{ g}$$

$$S_{ds} = 0.67 F_a S_s = 0.224 W$$

$$F_a = 1.6 \text{ Tbl 1615.1.2(1)}$$

$$R = 3 \text{ Tbl 1622.2.5(1)}$$

$$\text{Omega} = 2 \text{ Tbl 1622.2.5(1)}$$

$$I_e = 1.25 \text{ Tbl 1622.2.5(2)}$$

$$W = 111000 \text{ lbs}$$

$$V_{\text{seismic}} = C_s W \text{ Eq. 16-34}$$

$$= 0.093 W$$

$$C_s = S_{ds} / R * I = 0.0933$$

$$C_{s \text{ min}} = 0.044 S_{ds} I = 0.0123$$

$$\text{Use } C_s = 0.0933$$

$$T = 0.00000765 * (L / D)^2 * (wD / t)^{0.5} = 0.00000765 * (14. / 10.5)^2 * (46000 / 14 * 10.5 / 0.34)^{0.5}$$

$$= 0.000433 < 0.06 \text{ Rigid Structure}$$

$$V_{\text{simplified}} = 1.2 S_{ds} W / R = 0.090 W$$

$$V_{\text{nonstr}} = 0.14 S_{ds} I_e = 0.039 W$$

$$C_{s \text{ min nonstr}} = 0.8 S_1 I / R = 0.021 W$$

$$V_{\text{s rigid nonstr}} = 0.3 S_{ds} I W = 0.084 W$$

$$\text{Use } V_s = 0.093 W$$

$$V_{s \text{ asd}} = 0.067 W$$

$$\text{Overturning Moment} = V_s W * 1.2 \text{ sloshing} * H_{\text{otm}} = 62160 \text{ lbs-ft} \quad \text{Seismic Control}$$

Check existing anchorage according to API 650 Appendix E - Seismic design of Storage Tanks

Given information:

Material: Carbon steel
 Thickness: 0.34"
 Concrete slab thickness: Min 6"
 Full Tank +wt tank: 110000 lbs
 Agitator: 0 lbs
 Misc valves and structures: 1000 lbs

Seismic Analysis per API-650 Appendix E

Seismic zone, $Z =$ (Zone 4=0.4, zone 3=0.3, zone 2=0.2, zone 1=0.075)

Seismic Importance factor, $I_s =$ (Max $I = 1.5$, normally $I = 1.0$)

Site coefficient from soil type, $s =$ ($S_4=2$, $S_3=1.5$, $S_2=1.2$, $S_1=1.0$)

Specific gravity of liquid, $G =$

Tank diameter, $D =$

Height of tank, $H_t =$

Fill height from top of floor, $H =$

Weight of content, $W_t =$

Weight of shell, uncorroded, $W_s = .49 * (.34 / 12 * 2 * 22 / 7 * 5.25 * 14) =$

Weight of roof steel, uncorroded, $W_r = .49 * .20 / 12 * 2 * 22 / 7 * 4.5 =$

Roof equipment load in seismic, $W_e =$

Ratio of $D / H =$

Weight of roof & equipment load, $W_r = W_r' + W_e =$

Height of center of gravity of shell, $X_s = H / 2 =$

From Figure E-2 Effective masses, $W_1 / W_t =$

Contents in unison w/ shell, $W_1 = W_t * (W_1 / W_t) =$

From Figure E-2 Effective masses, $W_2 / W_t =$

First sloshing mode contents, $W_2 = W_t * (W_2 / W_t) =$

From Figure E-3 Centroids of seismic forces, $X_1 / H =$

Height to centroid, $X_1 = H * (X_1 / H) =$

From Figure E-3 Centroids of seismic forces, $X_2 / H =$

Height to centroid, $X_2 = H * (X_2 / H) =$

From Figure E-4 Factor k , $k =$

Natural period of first mode, $T = k * (D)^{0.5} =$

Lateral force coefficient, $C_1 = 0.24$

Lateral force coefficient, $C_2 = C_2 = 0.3S/T =$

Base shear $V_s = Z * I * (C_1 * (W_s + W_r + W_1) + C_2 * W_2) =$

Overturning, $M_{ot} = Z * I * (C_1 * W_s * X_s + C_1 * W_r * H_t + C_1 * W_1 * X_1 + C_2 * W_2 * X_2) =$

Friction resistance from contents, shell, roof steel, $F_{fric} = 0.4 * (W_t + W_s + W_r) =$

Factor of safety for sliding, $F_{Ss} = F_{fric} / V_s =$

Calculate resistance load against overturning:

Yield strength of tank material, $F_y =$

Thickness of bottom plate, $t_b = \max(t_f - c_o)$, thickness of floor or 0.25 =

Wt of contents allow for OT calc. per circumference, $W_L = 7.9 t_b (F_y / G H)^{0.5} =$

Max allowable for $W_L = 1.25 G H D =$

Resistance to OT by contents, $P_r = 22 / 7 * D * W_L =$

Resistance to OT by shell and roof, $P_{sr} = W_s + W_r =$

Total resistance to OT moment, $M_r = (P_r + P_{sr}) * D / 2 =$

Mot > Mr, Anchorage required

Wind analysis per API 650 section 3.11 Wind load on Tanks

Based on 30 psf on vertical plane surface or 22 psf on projected area of cylindrical surface

Wind pressure, $q_w =$

Base shear from wind, $V_w = q_w * H_t * D =$

Overturning due to wind, $M_{otmw} = V_w * 14 / 2 =$

Since Resistance to Overturning of tank < seismic or wind overturning, anchorage req'd.

0.40	
1.25	
1.50	
1.4	
10.50	ft
14.00	ft
14.00	ft
105.10	kips
6.414	kips
0.256	kips
1.00	kips
0.75	
1.26	Kips
7.00	ft
0.87	
90.95	Kips
0.19	
20.08	Kips
0.43	
6.01	
0.77	
10.79	
0.58	
1.87	seconds
0.24	
0.24	

14.25 Kips
87.08 K-ft
 44.71 Kips
3.14 > 1.5 OK

36.00	ksi
6.00	
39816.00	plf
257.25	plf
8.49	Kips
7.67	Kips
84.84	k-ft

Check existing anchor bolts.

Overturning, $Mot = Z * I * (C1 * Ws * Xs + C1 * Wr * Ht + C1 * W1 * X1 + C2 * W2 * X2) =$ 87.08 k-ft
 Base shear $Vs = Z * I * (C1 * (Ws + Wr + W1) + C2 * W2) =$ 14.25 Kips

Consider only two bolts are resisting overturning at one time.

Tension of one bolt = $87.08 / 10.5 \text{ ft} / 2 \text{ bolts} =$ 4.15 Kips
 Shear of one bolt = $14.25 / 4 =$ 3.56 Kips
 Combined stress of tension and shear = $(4.15/4.4)^{(5/3)} + (4.15/8.4)^{(5/3)} =$ 1.01 < 1.33

Cap of pullout cone fr each bolt = $.55 * .65 * (22/7 * 10^2/4) * (3000)^{0.5 * 4/3 * 3 * 1}$ 6.15 Kips O.k.

Check min t clip = $(6 * 4.15 * 2 * .75 / (4 * .75 * 36))^{.5} =$ 0.588 > 3/8"

Therefore the existing L4x4x3/8 clip thickness is inadequate.

Use: New (4) L4x4x5/8 w/ 3/4" diameter Kwik Bolt II expansion anchors
Min 4.75" embedment length
1/4" fillet weld, 3.5" length on both sides of L4x4x5/8 to existing tank.

Cap of weld = $.928 * 4 * 3.5 * 2 =$ 25.984 Kips > 4.15

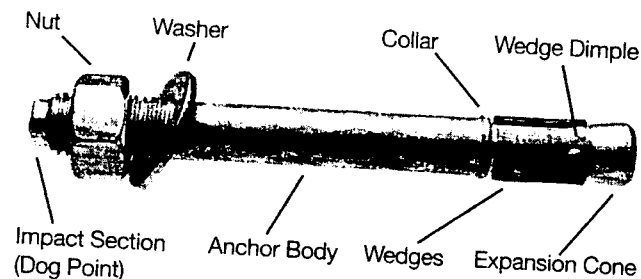
Kwik Bolt II Expansion Anchor



4.3.3

4.3.3.1 PRODUCT DESCRIPTION

The Kwik Bolt II is a stud type expansion anchor with a single piece wedge that performs as three independent wedges if necessary to provide consistent performance in a wide variety of medium-duty applications. Applicable base materials include concrete, lightweight concrete and grout-filled block.



Product Features

- Impact section (Dog Point) prevents thread damage during installation
- Independent 3-piece wedge with dimples help prevent anchor from spinning during installation
- Length identification code facilitates quality control & inspection after installation
- Anchor size is same as drill bit size for easy installation
- Comprehensive performance testing to provide high & consistent performance in concrete, light-weight concrete & grout filled block base materials
- Mechanical expansion allows immediate load application
- Can be installed in bottomless hole, which allows the anchor to be driven flush with the surface after use. Eliminates cutting bolt heads.
- Can be installed through the fixture, improving productivity
- Comprehensive product offering includes many head styles, sizes, carbon steel and stainless steel materials for a variety of applications

Guide Specifications

Expansion Anchors

Expansion anchors shall be stud type with a single piece three section wedge and zinc plated in accordance with ASTM B633. The anchors must meet the description in Federal Specification FF-S-325, Group II, Type 4, Class I for concrete expansion anchors. Anchors shall be Hilti Kwik Bolt II as supplied by Hilti, Inc., P.O. Box 21148, Tulsa, OK 74121.

Installation

Anchors to be installed in holes drilled with Hilti carbide tipped drill bits or matched tolerance diamond core bits. Anchors shall be installed per manufacturer's recommendations.

Listings/Approvals

- Underwriters Laboratory No. 203 "Pipe Hangers" (3/8"-3/4" diameters)
- International Conference of Building Officials (ICBO ES): Evaluation Report No. 4627, KB II
- International Conference of Building Officials (ICBO ES): Evaluation Report No. 5224, HCKB
- Southern Building Code Congress (SBCCI): Report No. 9930
- City of Los Angeles (COLA): Research Report No. 24946
- Conforms to the description in Federal Specification FF-S-325, Group II, Type 4, Class I
- Factory Mutual (FM) KB II 3/8" x 2 1/4" w/Rod Coupler
- Metro-Dade County Approval 98-0901.13

4.3.3.2 MATERIAL SPECIFICATIONS

Carbon Steel KB II studs conform to ASTM A510 with chemical composition of AISI 1038 except countersunk KB II, KB 3/4" x 12", KB II 1" x 6", KB II 1" x 9" and KB II 1" x 12" which conform to ASTM A108 with chemical composition of AISI 11L41

Wedges are manufactured from AISI 1010 carbon steel, except KB II 3/4" x 12", KB II 1" x 6", KB II 1" x 9" and KB II 1" x 12" wedges which conform to chemical composition of AISI 304

Nuts are carbon steel conforming to ASTM A563 Grade A and meet dimensional requirements of ANSI B18.2.2

Washers are carbon steel conforming to SAE 1005-1033 and meet dimensional requirements of ANSI 18.22.1 Type A Plain

All carbon steel parts are zinc plated in accordance with ASTM B633, Type III Fe/Zn 5

Stainless Steel KB II studs conform to ASTM A276 or ASTM A493 with chemical composition of either AISI 304 or 316 1/4" thru 9/16" over 9/16"

Stainless steel wedges are of the same material grade as bolts or superior.

Nuts are stainless steel conforming to ASTM F594 with chemical composition of either AISI 304 or 316 and meeting dimensional requirements of ANSI B18.2.2 to conform with stud material

Washers are AISI 304 or 316 stainless steel conforming to ASTM A240 to conform with stud material

Note: Special Order KB II's, nuts and washers may vary from standard materials.

MECHANICAL PROPERTIES	
f_y ksi (MPa)	min. f_u ksi (MPa)
41 (282)	75 (517)
75 (517)	90 (620)
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
76 (524)	90 (620)
64 (441)	76 (524)

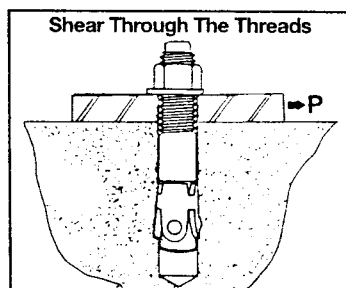
Kwik Bolt II Expansion Anchor

4.3.3

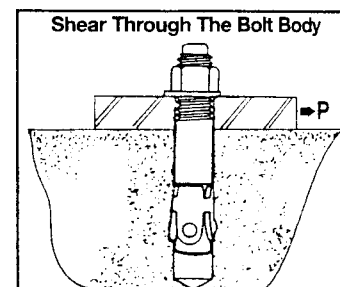
Carbon Steel Kwik Bolt II Allowable Loads in Concrete

Anchor Diameter in. (mm)	Embedment Depth in. (mm)	2000 psi (13.8 MPa)		3000 psi (20.7 MPa)		4000 psi (27.6 MPa)		6000 psi (41.4 MPa)	
		Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
1/4 (6.4)	1 1/8 (29)	270 (1.2)	430 (1.9)	330 (1.5)	430 (1.9)	380 (1.7)	430 (1.9)	470 (2.1)	430 (1.9)
	2* (51)	560 (2.5)	530 (2.4)	590 (2.6)	530 (2.4)	630 (2.8)	530 (2.4)	670 (3.0)	530 (2.4)
	3/4* (95)	670 (3.0)		670 (3.0)		670 (3.0)			
3/8 (9.5)	1 1/8 (41)	530 (2.4)	990 (4.4)	650 (2.9)	1040 (4.6)	750 (3.3)	1100 (4.9)	850 (3.8)	1100 (4.9)
	2 1/2* (64)	1200 (5.3)	1470 (6.5)	1290 (5.7)	1470 (6.5)	1370 (6.1)	1470 (6.5)	1550 (6.9)	1470 (6.5)
	4 1/4* (108)	1330 (5.9)		1390 (6.2)		1440 (6.4)			
1/2 (12.7)	2 1/4 (57)	1170 (5.2)	1940 (8.6)	1310 (5.8)	1970 (8.8)	1450 (6.4)	1970 (8.8)	1730 (7.7)	1970 (8.8)
	3 1/2* (89)	1870 (8.3)	2450 (10.9)	2130 (9.5)	2450 (10.9)	2400 (10.7)	2450 (10.9)	2800 (12.5)	2450 (10.9)
	6* (152)	2080 (9.3)		2310 (10.3)		2530 (11.3)			
5/8 (15.9)	2 3/4 (70)	1600 (7.1)	3070 (13.7)	1870 (8.3)	3070 (13.7)	2130 (9.5)	3070 (13.7)	2670 (11.9)	3070 (13.7)
	4** (102)	2400 (10.7)	3840 (17.1)	2850 (12.7)	3840 (17.1)	3290 (14.6)	3840 (17.1)	4190 (18.6)	3840 (17.1)
	7** (178)	3200 (14.2)		3470 (15.4)		3730 (16.6)			
3/4 (19.1)	3 1/4 (83)	1970 (8.8)	4140 (18.4)	2320 (10.3)	4140 (18.4)	2670 (11.9)	4140 (18.4)	3200 (14.2)	4140 (18.4)
	4 3/4** (121)	2930 (13.0)	5120 (22.8)	4130 (18.4)	5120 (22.8)	4800 (21.4)	5120 (22.8)	5870 (26.1)	5120 (22.8)
	8** (203)	4000 (17.8)		4930 (21.9)		5870 (26.1)		6320 (28.1)	
1 (25.4)	4 1/2 (114)	3330 (14.8)	7070 (31.4)	4050 (18.0)	7600 (33.8)	4670 (20.8)	8140 (36.2)	5070 (22.6)	9200 (40.9)
	6 (152)	4930 (21.9)	9200 (40.9)	6000 (26.7)	9200 (40.9)	7070 (31.4)	9200 (40.9)	8400 (37.4)	
	9 (229)	6670 (29.7)		7670 (34.1)		8670 (38.6)		10670 (47.5)	

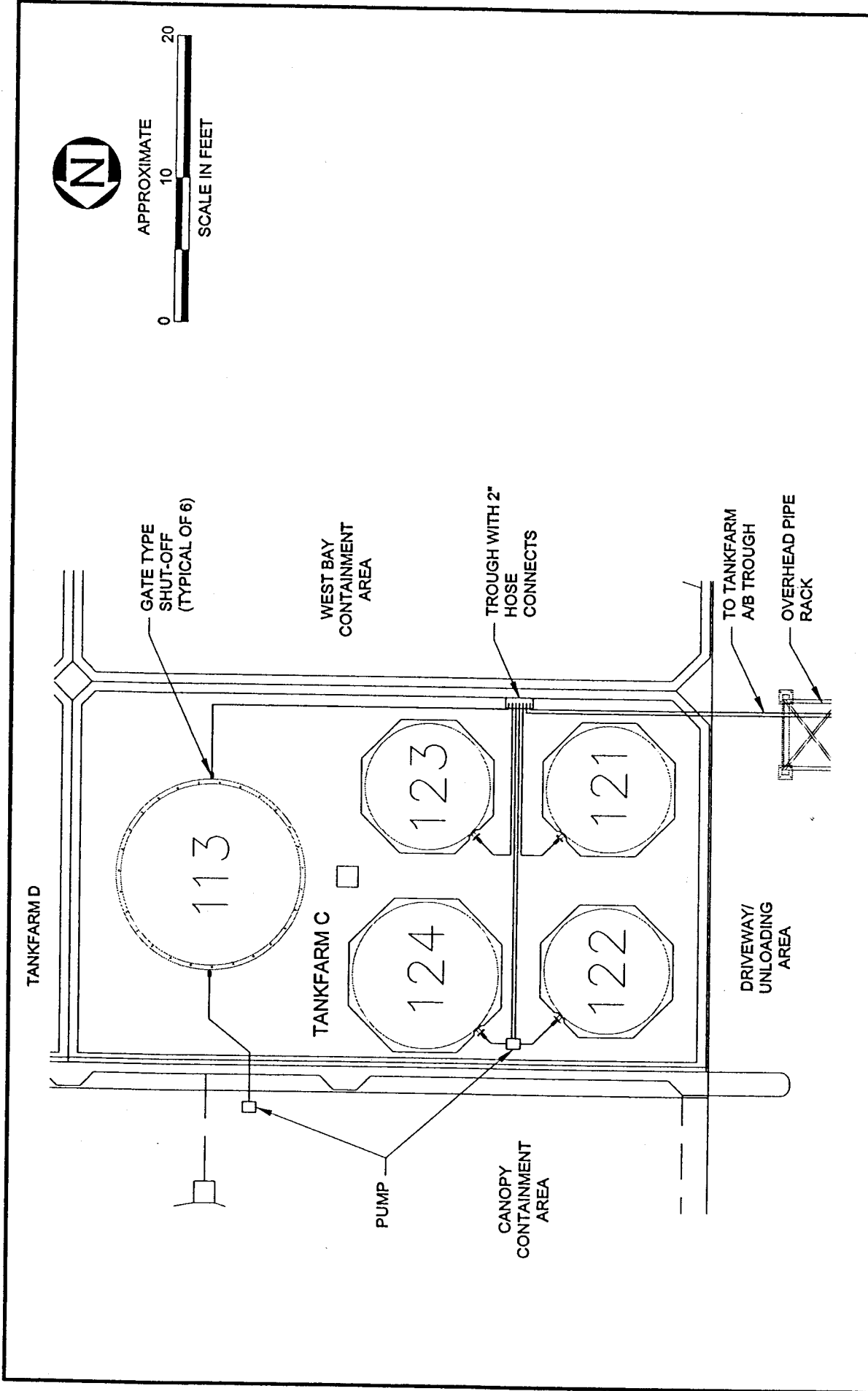
* Values shown are for a shear plane acting through the anchor bolt body. When the shear plane is acting through the anchor bolt threads, reduce the shear values by 20%.



** Values shown are for a shear plane acting through the anchor bolt body. When the shear plane is acting through the anchor bolt threads, reduce the shear value by 12%.



All other values shown are for shear plane acting through either body or threads.



Tankfarm C
 Romic - Southwest
 Chandler, Arizona
 Figure D-7

REFERENCE: BASEMAP PROVIDED BY:

ROMIC
 ENVIRONMENTAL TECHNOLOGIES CORP.
 ROMIC SOUTHWEST, CHANDLER, ARIZONA



URS

Tank Certification Report

Tank T-132

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On February 7, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #132, a 4,100-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is acidic hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 4,100-gallon tank, (Tank #132), is constructed of high-density polyethylene. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of polyethylene. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located inside of a secondary containment tank. This tank is located inside of a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

Estimated Remaining Service Life

The tank was installed in 1992. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-401 to TK-403

Weight: 1,000± lbs. Empty

Location: Tank Farm E

49,000± lbs. Full

Service: Waste Storage

Temp (°F) AMB.

Contents: Alkaline waste

Pressure (Psig): ATM.

Size: 4,100 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: High density polyethylene

Support: Sloped Bottom

Method of Construction: Molded

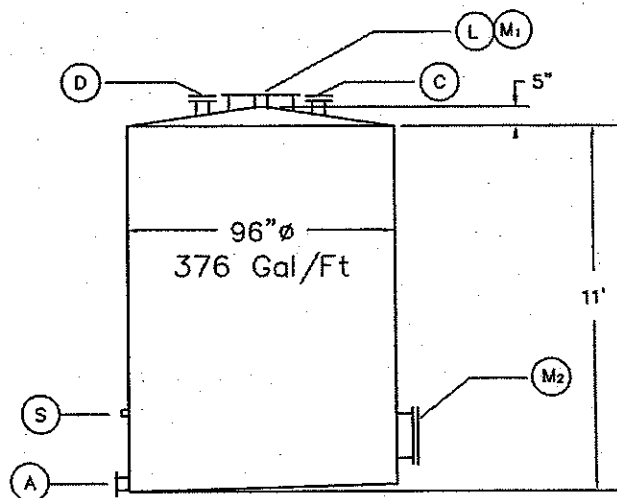
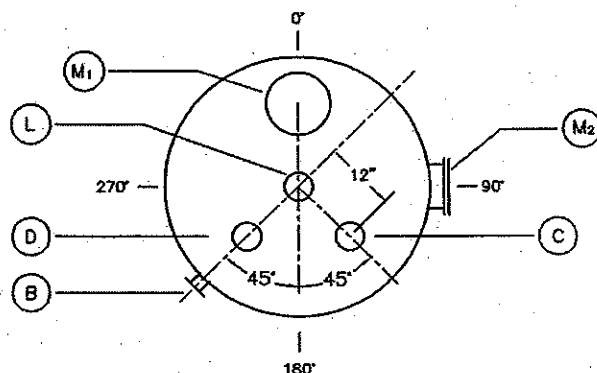
Insulation: n/a Agitator: n/a

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard cone top
2. Sloped bottom



Rev No.

Revision

By

Date

Apprvd

Date

1

Update for 2004 Part B

RP

4-14-04

WK

4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number TK-401 to TK-403

METRO ENVIRONMENTAL SERVICES, INC.

1256-B West Brooks Street, Ontario, CA 91762
Tel: (909) 983-3848 Fax: (909) 983-3498

LSI PN: 2K502 Tank 132 & tank 136
Project Name: Romic Environmental Technologies Corporation
Project Location: ROMIC Southwest, Chandler, Arizona.

Issued: 02/12/05

Table of Contents:

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1	Scope of work, design loads and tank data	1
2	Seismic and wind analysis for overturning moment	2
3	Design new brace beam, support column, base plate and anchor bolts	3
	Attach two page of Hilti Kwik II bolt technical data	



SCOPE OF WORK:**Tank Designation: TK 132 and T 136.**

- Analyzed existing anchorage for 8'-0" Diameter by 11'-0" high Polyethylene tank setting inside of a 12'-0" diameter 6'-0" high containment tank
- Design brace beam, support column, anchor bolts and base plate.

DESIGN LOADS:**2000 International Building Code. 80 MPH wind, Seismic Use group II**

WIND: $F = Q_z * G * C_f * A_f$
 Where $Q_z = 0.00256 K_z K_{zt} K_d V^2 I$
 $Q_z = 0.00256 * 0.9 * 1.0 * 0.95 * 90^2 * 1.0 = 17.73 \text{ psf}$

$$F_{\text{wnd}} = 2532 \text{ lbs.}$$

$$M_{\text{otm}} = F_{\text{wind}} * H_{\text{otm}} = 13925 \text{ lbs-ft}$$

H =	11	ft
D =	8	ft
K _z =	0.9	Tbl 6-3 Case2
K _{zt} =	1	Tbl 6-4 Flat
K _d =	0.95	Tbl 6-4
V =	90	MPH Fig 6-1
I =	1	Tbl 6-1
For H/D =	1.375	
C _f =	1.4	Tbl 6-19
G _f =	0.85	Sec 6.5.8
A _f =	120	Sq. Ft.
H _{otm} =	5.5	ft

Location: Chandler State: Arizona

From Fig. 1615(1): $S_s = 0.21 \text{ g}$
 From Fig. 1615(2): $S_1 = 0.063 \text{ g}$

$$S_d s = 0.67 F_a S_s = 0.224 \text{ W}$$

$$V_{\text{seismic}} = C_s W \quad \text{Eq. 16-34}$$

$$= 0.093 W$$

$$V_{\text{simplified}} = 1.2 S_d s W / R = 0.090 W$$

$$V_{\text{nonstr}} = 0.14 S_d s I_e = 0.039 W$$

$$C_s \text{ min nonstr} = 0.8 S_1 I / R = 0.021 W$$

$$V_{\text{s rigid nonstr}} = 0.3 S_d s I W = 0.084 W$$

Siteclass: D

$$F_a = 1.6 \text{ Tbl 1615.1.2(1)}$$

$$R = 3 \text{ Tbl 1622.2.5(1)}$$

$$\text{Omega} = 2 \text{ Tbl 1622.2.5(1)}$$

$$I_e = 1.25 \text{ Tbl 1622.2.5(2)}$$

$$W = 50000 \text{ lbs}$$

$$C_s = S_d s / R * I = 0.0933$$

$$C_s \text{ min} = 0.044 S_d s I = 0.0123$$

$$\text{Use } C_s = 0.0933$$

$$\text{Use } V_s = 0.093 W$$

$$V_{\text{s asd}} = 0.067 W$$

$$\text{Overturning Moment} = V_s W * 1.2 \text{ sloshing} * H_{\text{otm}} = 22000 \text{ lbs-ft} \quad \text{Seismic Control}$$

Check existing anchorage according to API 650 Appendix E - Seismic design of Storage Tanks

Given information:

Material: High Density Polyethylene
 Thickness: 0.88
 Concrete slab thickness: Min 6"
 Full Tank +wt tank: 49000 lbs
 Agitator: 0 lbs
 Misc valves and structures: 1000 lbs

Seismic Analysis per API-650 Appendix ESeismic zone, $Z =$ (Zone 4=0.4, zone 3=0.3, zone 2=0.2, zone 1=0.075)Seismic Importance factor, $I_s =$ (Max $I = 1.5$, normally $I = 1.0$)Site coefficient from soil type, $s =$ ($S_4=2$, $S_3=1.5$, $S_2=1.2$, $S_1=1.0$)Specific gravity of liquid, $G =$ Tank diameter, $D =$ Height of tank, $H_t =$ Fill height from top of floor, $H =$ Weight of content, $W_t = 22/7 \cdot (D/2)^2 \cdot H \cdot 62.4 \text{ pcf} / 1000 =$ Weight of shell, uncorroded, $W_s =$ Weight of roof, $W_r =$ Roof equipment load in seismic, $W_e =$ Ratio of $D / H =$ Weight of roof & equipment load, $W_r = W_r + W_e =$ Height of center of gravity of shell, $X_s = H / 2 =$ From Figure E-2 Effective masses, $W_1 / W_t = 0.870$ Contents in unison w/ shell, $W_1 = W_t \cdot (W_1 / W_t) =$ From Figure E-2 Effective masses, $W_2 / W_t = 0.186$ First sloshing mode contents, $W_2 = W_t \cdot (W_2 / W_t) =$ From Figure E-3 Centroids of seismic forces, $X_1 / H = 0.431$ Height to centroid, $X_1 = H \cdot (X_1 / H) =$ From Figure E-3 Centroids of seismic forces, $X_2 / H = 0.776$ Height to centroid, $X_2 = H \cdot (X_2 / H) =$ From Figure E-4 Factor k , $k = 0.577$ Natural period of first mode, $T = k \cdot (D)^{0.5} =$ Lateral force coefficient, $C_1 = 0.6$ Lateral force coefficient, $C_2 = C_2 = 0.3S/T =$

0.40
1.25
1.50
1.4
8.00 ft
11.00 ft
11.00 ft
48.32 kips
1.000 kips
0.500 kips
0.50 kips
0.73
1.00 Kips
5.50 ft
0.87
42.06 Kips
0.19
8.99 Kips
0.43
4.74
0.78
8.54
0.58
1.63 seconds
0.24
0.28

Base shear $V_s = Z \cdot I \cdot (C_1 \cdot (W_s + W_r + W_1) + C_2 \cdot W_2) =$ Overturning, $Mot = Z \cdot I \cdot (C_1 \cdot W_s \cdot X_s + C_1 \cdot W_r \cdot H_t + C_1 \cdot W_1 \cdot X_1 + C_2 \cdot W_2 \cdot X_2) =$ Friction resistance from contents, shell, roof steel, $F_{fric} = 0.4 \cdot (W_t + W_s + W_r) =$ Factor of safety for sliding, $FSS = Fric / V_s =$

6.53 Kips
35.96 K-ft
 19.93 Kips
3.05 > 1.5 O.K.

Calculate resistance load against overturning:Yield strength of tank material, $F_y =$ Thickness of bottom plate, $t_b = \max(t_f - c_o)$, thickness of floor or 0.25 =Wt of contents allow for OT calc. per circumference, $W_L = 7.9 t_b (F_y / G H)^{0.5} =$ Max allowable for $W_L = 1.25 G H D = 154 \text{ plf}$

Use:

Resistance to OT by contents, $P_r = 22/7 \cdot D \cdot W_L =$ Resistance to OT by shell and roof, $P_{sr} = W_s + W_r =$ Total resistance to OT moment, $M_r = (P_r + P_{sr}) \cdot D / 2 =$ **Mot > Mr, Anchorage required**

6.00 ksi
0.88
2101.22 plf
154.00 plf
3.87 Kips
2.00 Kips
23.49 k-ft

Wind analysis per API 650 section 3.11 Wind load on Tanks

Based on 30 psf on vertical plane surface or 22 psf on projected area of cylindrical surface

Wind pressure, $q_w =$ Base shear from wind, $V_w = q_w \cdot H_t \cdot D =$ Overturning due to wind, $Mot_{mw} = V_w \cdot H_t / 2 =$

22.00 psf
1.94 Kips
10.65 K-ft

Wind pressure from 2001CBC, $P_w = C_e C_q q_s l_w =$ For 70 MPH wind, Exp. C Where 22' $C_e = 1.15$ $C_q =$ 70mph $q_s = 12.6$ $l_w =$ Overturning due to wind from 2001CBC, $Mot_{mw} = P_w \cdot H_t \cdot D \cdot H_t / 2 =$

21.66 psf
1.30
1.15
10.48 k-ft

Since Resistance to Overturning of tank < seismic or wind overturning, anchorage req'd.

Design braced beam, support column, base plate and anchor bolts.

$$\begin{aligned} \text{Overturning, } M_o &= Z * I * (C1 * W_s * X_s + C1 * W_r * H_t + C1 * W1 * X1 + C2 * W2 * X2) = & 35.96 \text{ k-ft} \\ \text{Base shear } V_s &= Z * I * (C1 * (W_s + W_r + W1) + C2 * W2) = & 6.53 \text{ Kips} \end{aligned}$$

Design an anchorage steel frame for overturning:

$$S_x \text{ min} = M * 12 * .75 / (.6 * 36) = 11.72 \text{ in}^3$$

Use W 8 x 18 brace beam w/ W8x18 column. Fy = 36 ksi

$$\text{Shear weld at } 3/4" \text{ thick cap plate} = 6.53 / (.928 * 3^{4/3}) = 1.76 \text{ in.}$$

$$\begin{aligned} 1/4" \text{ Weld at base} &= M / 2 * 12 * .75 / (b d + d^2 / 3) = b = 5.25, d = 8.125 & 2.50 \text{ kli} \\ \text{Cap of } 3/16" \text{ fillet weld} &= .928 * 4 = & 3.712 \text{ kli/in} \end{aligned}$$

$$\text{Tension on the base plate} = M * 12 / (8.125 + 2 + 2) / 6 \text{ bolts} = 5.93 \text{ Kip} < 6$$

$$\text{Shear on } 1" \text{ diameter bolts} = 6.53 / 12 \text{ bolts} = 0.54 \text{ Kips} < 9.2$$

$$\text{Combine shear and tension} = (.54 / 9.2)^{(5/3)} + (5.93 / 6)^{(5/3)} = 0.990 < 1.33$$

$$\text{Base plate thk min} = (6 * 3 * 5.93 * 2 * .75 / (10 * .75 * 36)) + D65^{.5} = 0.593 \text{ in}$$

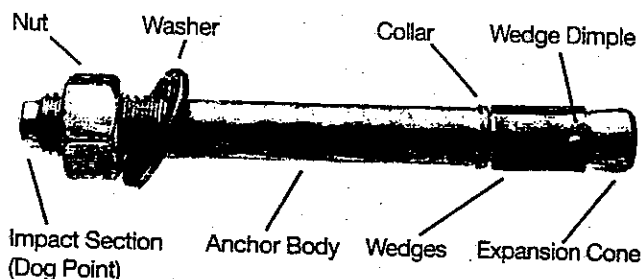
$$\text{Cap of pullout cone fr 3 bolts} = .55 * .65 * (22/7 * 10^2/4) * (3000)^{0.5 * 4/3 * 3} = 26.59 \text{ Kips O.k.}$$

Use: **Cap plate 3/4" x 8 x 9 w/ 3/16" fillet weld, weld flange to cap plate.**

Use: **Base plate 3/4" x 10 x 1'- 4" w/ (6) 1" dia. Hilti Kwik Bolts II, 6" embedment**

Kwik Bolt II Expansion Anchor**4.3.3****4.3.3.1 PRODUCT DESCRIPTION**

The Kwik Bolt II is a stud type expansion anchor with a single piece wedge that performs as three independent wedges if necessary to provide consistent performance in a wide variety of medium-duty applications. Applicable base materials include concrete, lightweight concrete and grout-filled block.

**Product Features**

- Impact section (Dog Point) prevents thread damage during installation
- Independent 3-piece wedge with dimples help prevent anchor from spinning during installation
- Length identification code facilitates quality control & inspection after installation
- Anchor size is same as drill bit size for easy installation
- Comprehensive performance testing to provide high & consistent performance in concrete, light-weight concrete & grout filled block base materials
- Mechanical expansion allows immediate load application
- Can be installed in bottomless hole, which allows the anchor to be driven flush with the surface after use. Eliminates cutting bolt heads.
- Can be installed through the fixture, improving productivity
- Comprehensive product offering includes many head styles, sizes, carbon steel and stainless steel materials for a variety of applications

Guide Specifications**Expansion Anchors**

Expansion anchors shall be stud type with a single piece three section wedge and zinc plated in accordance with ASTM B633. The anchors must meet the description in Federal Specification FF-S-325, Group II, Type 4, Class I for concrete expansion anchors. Anchors shall be Hilti Kwik Bolt II as supplied by Hilti, Inc., P.O. Box 21148, Tulsa, OK 74121.

Installation

Anchors to be installed in holes drilled with Hilti carbide tipped drill bits or matched tolerance diamond core bits. Anchors shall be installed per manufacturer's recommendations.

Listings/Approvals

- Underwriters Laboratory No. 203 "Pipe Hangers" (3/8"-3/4" diameters)
- International Conference of Building Officials (ICBO ES): Evaluation Report No. 4627, KB II
- International Conference of Building Officials (ICBO ES): Evaluation Report No. 5224, HCKB
- Southern Building Code Congress (SBCCI): Report No. 9930
- City of Los Angeles (COLA): Research Report No. 24946
- Conforms to the description in Federal Specification FF-S-325, Group II, Type 4, Class 1
- Factory Mutual (FM) KB II 3/8" x 2 1/4" w/Rod Coupler
- Metro-Dade County Approval 98-0901.13

4.3.3.2 MATERIAL SPECIFICATIONS

Carbon Steel KB II studs conform to ASTM A510 with chemical composition of AISI 1038 except countersunk KB II, KB 3/4" x 12", KB II 1" x 6", KB II 1" x 9" and KB II 1" x 12" which conform to ASTM A108 with chemical composition of AISI 11L41

Wedges are manufactured from AISI 1010 carbon steel, except KB II 3/4" x 12", KB II 1" x 6", KB II 1" x 9" and KB II 1" x 12" wedges which conform to chemical composition of AISI 304

Nuts are carbon steel conforming to ASTM A563 Grade A and meet dimensional requirements of ANSI B18.2.2

Washers are carbon steel conforming to SAE 1005-1033 and meet dimensional requirements of ANSI 18.22.1 Type A Plain

All carbon steel parts are zinc plated in accordance with ASTM B633, Type III Fe/Zn 5

Stainless Steel KB II studs conform to ASTM A276 or ASTM A493 with chemical composition of either AISI 304 or 316 1/4" thru 9/16" over 9/16"

Stainless steel wedges are of the same material grade as bolts or superior.

Nuts are stainless steel conforming to ASTM F594 with chemical composition of either AISI 304 or 316 and meeting dimensional requirements of ANSI B18.2.2 to conform with stud material

Washers are AISI 304 or 316 stainless steel conforming to ASTM A240 to conform with stud material

Note: Special Order KB II's, nuts and washers may vary from standard material

MECHANICAL PROPERTIES	
f_y ksi (MPa)	min. f_u ksi (MPa)
41 (282)	75 (517)
75 (517)	90 (620)
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
76 (524)	90 (620)
64 (441)	76 (524)

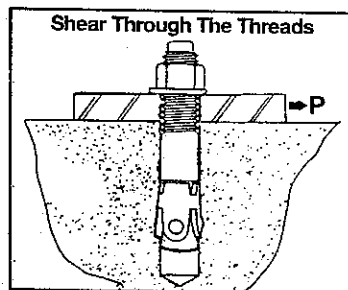
Kwik Bolt II Expansion Anchor

4.3.3

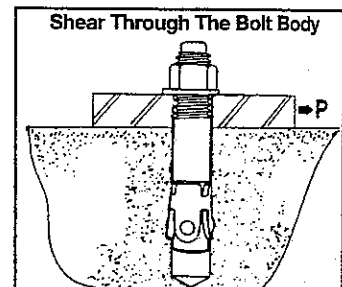
Carbon Steel Kwik Bolt II Allowable Loads in Concrete

Anchor Diameter in. (mm)	Embedment Depth in. (mm)	2000 psi (13.8 MPa)		3000 psi (20.7 MPa)		4000 psi (27.6 MPa)		6000 psi (41.4 MPa)	
		Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
1/4 (6.4)	1 1/8 (29)	270 (1.2)	430 (1.9)	330 (1.5)	430 (1.9)	380 (1.7)	430 (1.9)	470 (2.1)	430 (1.9)
	2* (51)	560 (2.5)	530 (2.4)	590 (2.6)	530 (2.4)	630 (2.8)	530 (2.4)	670 (3.0)	530 (2.4)
	3 1/4* (95)	670 (3.0)		670 (3.0)		670 (3.0)			
3/8 (9.5)	1 1/8 (41)	530 (2.4)	990 (4.4)	650 (2.9)	1040 (4.6)	750 (3.3)	1100 (4.9)	850 (3.8)	1100 (4.9)
	2 1/2* (64)	1200 (5.3)	1470 (6.5)	1290 (5.7)	1470 (6.5)	1370 (6.1)	1470 (6.5)	1550 (6.9)	1470 (6.5)
	4 1/4* (108)	1330 (5.9)		1390 (6.2)		1440 (6.4)			
1/2 (12.7)	2 1/4 (57)	1170 (5.2)	1940 (8.6)	1310 (5.8)	1970 (8.8)	1450 (6.4)	1970 (8.8)	1730 (7.7)	1970 (8.8)
	3 1/2* (89)	1870 (8.3)	2450 (10.9)	2130 (9.5)	2450 (10.9)	2400 (10.7)	2450 (10.9)	2800 (12.5)	2450 (10.9)
	6* (152)	2080 (9.3)		2310 (10.3)		2530 (11.3)			
5/8 (15.9)	2 1/4 (70)	1600 (7.1)	3070 (13.7)	1870 (8.3)	3070 (13.7)	2130 (9.5)	3070 (13.7)	2670 (11.9)	3070 (13.7)
	4** (102)	2400 (10.7)	3840 (17.1)	2850 (12.7)	3840 (17.1)	3290 (14.6)	3840 (17.1)	4190 (18.6)	3840 (17.1)
	7** (178)	3200 (14.2)		3470 (15.4)		3730 (16.6)			
3/4 (19.1)	3 1/4 (83)	1970 (8.8)	4140 (18.4)	2320 (10.3)	4140 (18.4)	2670 (11.9)	4140 (18.4)	3200 (14.2)	4140 (18.4)
	4 1/4** (121)	2930 (13.0)	5120 (22.8)	4130 (18.4)	5120 (22.8)	4800 (21.4)	5120 (22.8)	5870 (26.1)	5120 (22.8)
	8** (203)	4000 (17.8)		4930 (21.9)		5870 (26.1)		6320 (28.1)	
1 (25.4)	4 1/2 (114)	3330 (14.8)	7070 (31.4)	4050 (18.0)	7600 (33.8)	4670 (20.8)	8140 (36.2)	5070 (22.6)	9200 (40.9)
	6 (152)	4930 (21.9)	9200 (40.9)	6000 (26.7)	9200 (40.9)	7070 (31.4)	9200 (40.9)	8400 (37.4)	
	9 (229)	6670 (29.7)		7670 (34.1)		8670 (38.6)		10670 (47.5)	

* Values shown are for a shear plane acting through the anchor bolt body. When the shear plane is acting through the anchor bolt threads, reduce the shear values by 20%.

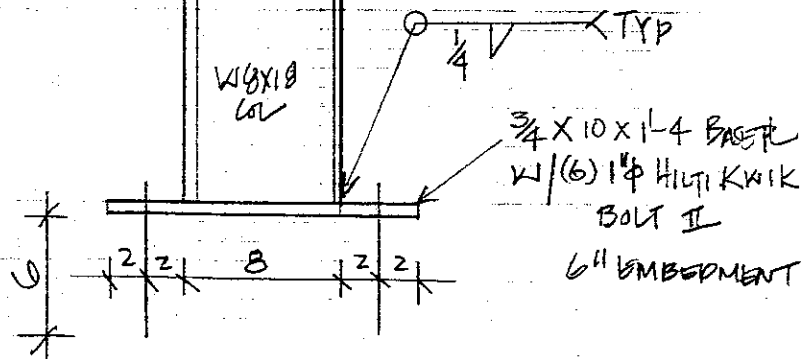
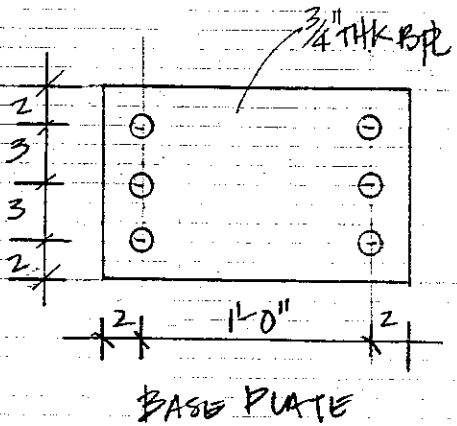
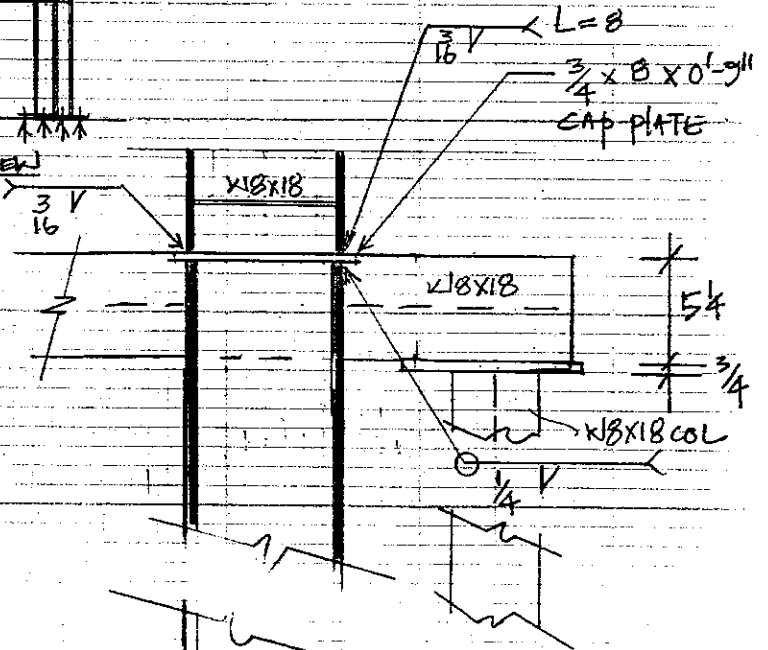
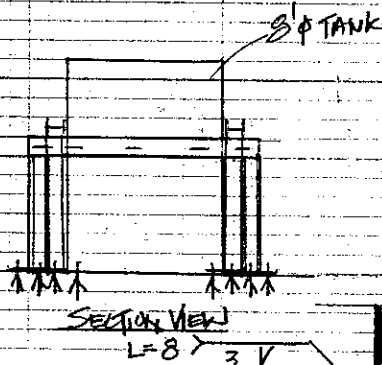
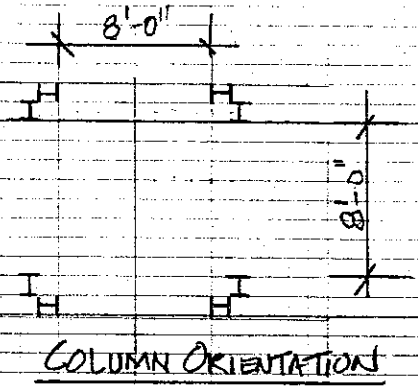
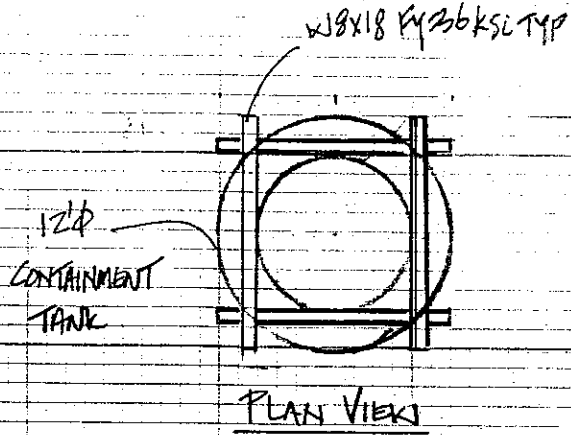


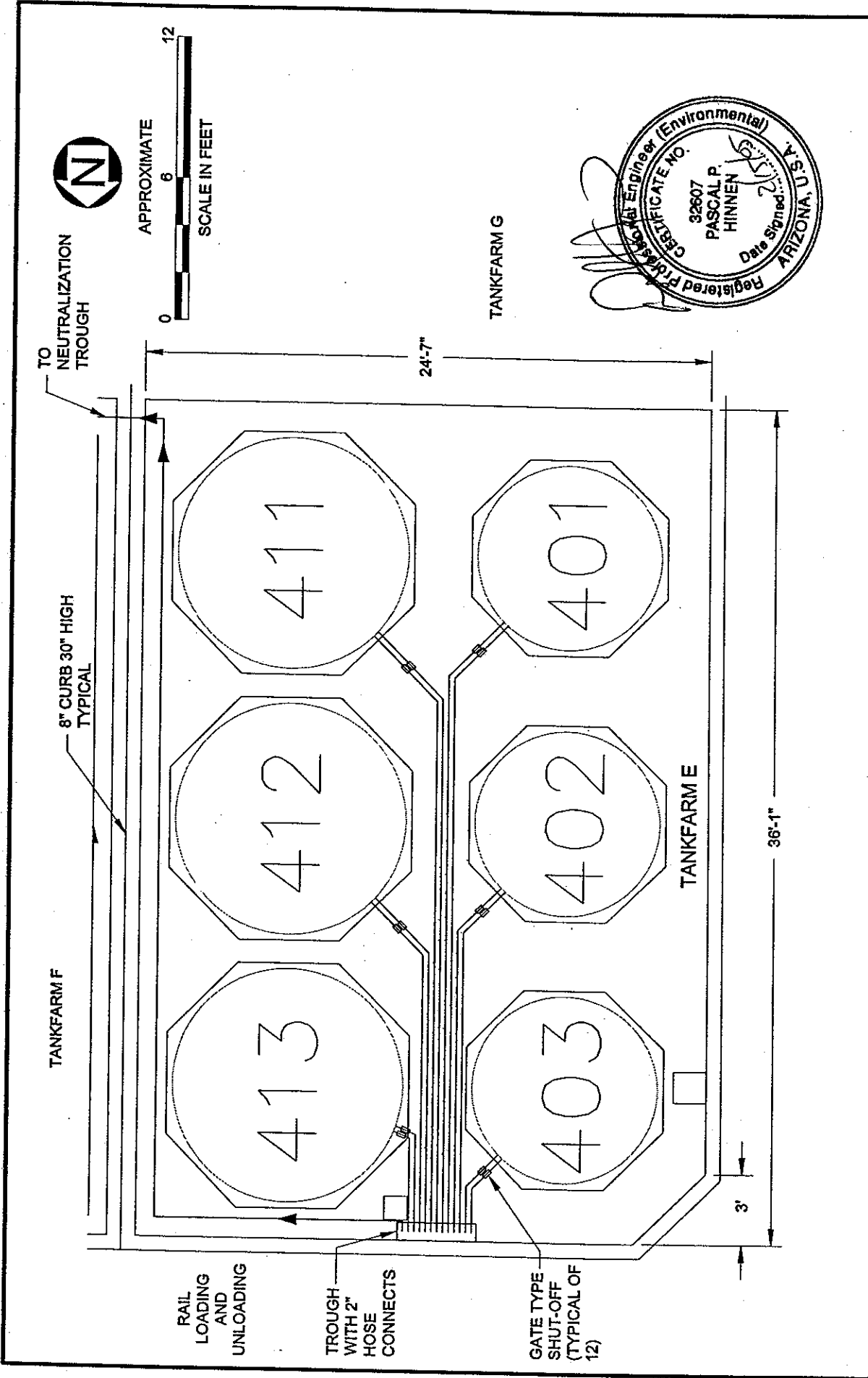
** Values shown are for a shear plane acting through the anchor bolt body. When the shear plane is acting through the anchor bolt threads, reduce the shear value by 12%.



All other values shown are for shear plane acting through either body or threads.

TANK T-132 AND T-136





Proposed Tankfarm E
 Romic - Southwest
 Chandler, Arizona
 Figure D-9

REFERENCE: BASEMAP PROVIDED BY:

ROMIC
 ENVIRONMENTAL TECHNOLOGIES CORP.
 ROMIC SOUTHWEST, CHANDLER, ARIZONA



Tank Certification Report

Tank T-136

Prepared for: Romic Environmental Technologies Corp,
6760 West Allison Road
Chandler, AZ 85226

Prepared by: Metro Environmental Services, Inc.
1256-B West Brooks Street
Ontario, CA 91762



INTRODUCTION

On January 26, 2005 in accordance with Title 22 CCR Section 66264.192, "Design and Installation of New Tank Systems and Components", Metro Environmental Services, Inc. performed an assessment of Tank #136, a 4,100-gallon hazardous waste storage tank at the Romic Environmental Technologies Corp facility located at 6760 West Allison Road in Chandler, Arizona. The tank and associated piping system serve to store hazardous waste.

ASSESSMENT ITEMS

Compatibility of Waste Material with Tank Materials of Construction

The waste material contained in this tank is acidic hazardous waste. This material is compatible with the materials of construction of the tank and piping.

Tank / Piping System Details

The 4,100-gallon tank, (Tank #136), is constructed of high-density polyethylene. Please refer to the attached Tank Specification Sheet for tank details.

The piping system for this tank is constructed of polyethylene. All piping appears to have been installed using good engineering and mechanical practices and is supported adequately to prevent against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

Leak Detection and Spill Prevention Equipment / Instrumentation

The entire tank and piping system is aboveground and is easily accessible. Leak detection will be by visual inspection. Qualified personnel will inspect the entire tank and piping system at least once per day.

Tank Support System

The tank rests directly upon the concrete slab floor. This tank system was installed under the supervision of site personnel.

Tank Secondary Containment System

The tank is located inside of a secondary containment tank. This tank is located inside of a containment area that also contains a number of additional hazardous waste storage and processing tanks. Containment has been certified separately by others.



Tank and Piping System Installation Inspection

The tank and piping was inspected for the following installation defects: weld breaks; punctures; cracks; corrosion; damaged fittings; and other structural damage or inadequate construction or installation. No discrepancies were noted.

System Tightness Testing

The system was tested for tightness by filling with product prior to the final inspection. No leakage or signs of previous leakage were evident during the final inspection.

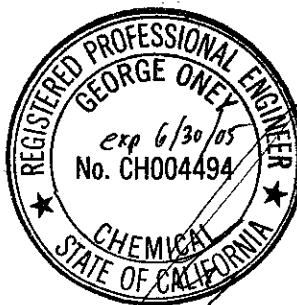
Estimated Remaining Service Life

The tank was installed in 1992. Considering the current age of the system, materials of construction, intended use, and quality of construction, the remaining service life is estimated to be greater than five years. A re-inspection should be performed five years from the date of this inspection.

CERTIFICATION

I hereby certify that the installed tanks and components of the piping system referenced in this report have been properly inspected and are capable of handling the material referenced in this report without the likelihood of release.

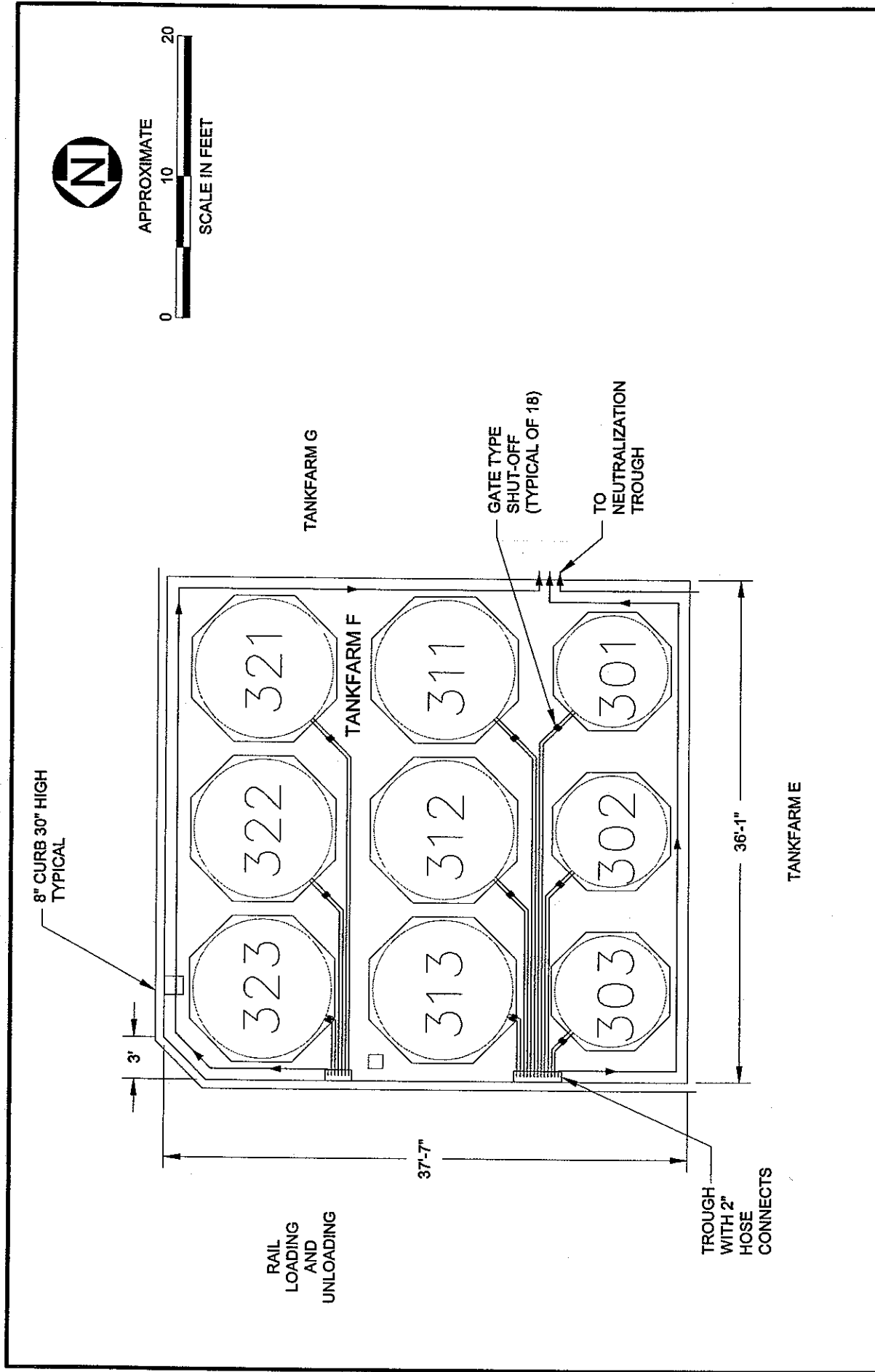
I certify under penalty of law that this document was prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



George A. Oney, P.E.
Chemical Engineer
Registration No. CH004494

Insulation: n/a Agitator: n/a

REMARKS



Proposed Tankfarm F
 Romic - Southwest
 Chandler, Arizona
 Figure D-10

REFERENCE: BASEMAP PROVIDED BY:
ROMIC
 ENVIRONMENTAL TECHNOLOGIES CORP.
 ROMIC SOUTHWEST, CHANDLER, ARIZONA



METRO ENVIRONMENTAL SERVICES, INC.

1256-B West Brooks Street, Ontario, CA 91762
Tel: (909) 983-3848 Fax: (909) 983-3498

LSI PN: 2K502 Tank 132 & tank 136
Project Name: Romic Environmental Technologies Corporation
Project Location: ROMIC Southwest, Chandler, Arizona.

Issued: 02/12/05

Table of Contents:

Page No.

1	Scope of work, design loads and tank data	1
2	Seismic and wind analysis for overturning moment	2
3	Design new brace beam, support column, base plate and anchor bolts	3
	Attach two page of Hilti Kwik II bolt technical data	



SCOPE OF WORK:
Tank Designation: TK 132 and T 136.

- Analyzed existing anchorage for 8'-0" Diameter by 11'-0" high Polyethylene tank setting inside of a 12'-0" diameter 6'-0" high containment tank
- Design brace beam, support column, anchor bolts and base plate.

DESIGN LOADS:
2000 International Building Code. 80 MPH wind, Seismic Use group II

WIND: $F = Q_z * G * C_f * A_f$
 Where $Q_z = 0.00256 K_z K_{zt} K_d V^2 I$
 $Q_z = 0.00256 * 0.9 * 1.0 * 0.95 * 90^2 * 1.0 = 17.73 \text{ psf}$

$F_{\text{wnd}} = 2532 \text{ lbs.}$
 $M_{\text{otm}} = F_{\text{wind}} * H_{\text{otm}} = 13925 \text{ lbs-ft}$

H =	11 ft
D =	8 ft
K _z =	0.9 Tbl 6-3 Case2
K _{zt} =	1 Tbl 6-4 Flat
K _d =	0.95 Tbl 6-4
V =	90 MPH Fig 6-1
I =	1 Tbl 6-1
For H/D =	1.375
C _f =	1.4 Tbl 6-19
G _f =	0.85 Sec 6.5.8
A _f =	120 Sq. Ft.
H _{otm} =	5.5 ft

Location: Chandler State: Arizona

From Fig. 1615(1): $S_s = 0.21 \text{ g}$
 From Fig. 1615(2): $S_1 = 0.063 \text{ g}$

$S_{ds} = 0.67 F_a S_s = 0.224 \text{ W}$

$V_{\text{seismic}} = C_s W \text{ Eq. 16-34}$
 $= 0.093 \text{ W}$

$V_{\text{simplified}} = 1.2 S_{ds} W / R = 0.090 \text{ W}$
 $V_{\text{nonstr}} = 0.14 S_{ds} I_e = 0.039 \text{ W}$
 $C_{s \text{ min nonstr}} = 0.8 S_1 I / R = 0.021 \text{ W}$
 $V_{\text{rigid nonstr}} = 0.3 S_{ds} I W = 0.084 \text{ W}$

Siteclass: D
 $F_a = 1.6 \text{ Tbl 1615.1.2(1)}$
 $R = 3 \text{ Tbl 1622.2.5(1)}$
 $\Omega = 2 \text{ Tbl 1622.2.5(1)}$
 $I_e = 1.25 \text{ Tbl 1622.2.5(2)}$
 $W = 50000 \text{ lbs}$

$C_s = S_{ds} / R * I = 0.0933$
 $C_{s \text{ min}} = 0.044 S_{ds} I = 0.0123$
 Use $C_s = 0.0933$

Use $V_s = 0.093 \text{ W}$
 $V_{s \text{ asd}} = 0.067 \text{ W}$

Overturning Moment = $V_s W * 1.2 \text{ sloshing} * H_{\text{otm}} = 22000 \text{ lbs-ft}$ **Seismic Control**

Check existing anchorage according to API 650 Appendix E - Seismic design of Storage Tanks

Given information:

Material: High Density Polyethylene
 Thickness: 0.88
 Concrete slab thickness: Min 6"
 Full Tank +wt tank: 49000 lbs
 Agitator: 0 lbs
 Misc valves and structures: 1000 lbs

Seismic Analysis per API-650 Appendix ESeismic zone, $Z =$ (Zone 4=0.4, zone 3=0.3, zone 2=0.2, zone 1=0.075)Seismic Importance factor, $I_s =$ (Max $I = 1.5$, normally $I = 1.0$)Site coefficient from soil type, $s =$ ($S_4=2$, $S_3=1.5$, $S_2=1.2$, $S_1=1.0$)Specific gravity of liquid, $G =$ Tank diameter, $D =$ Height of tank, $H_t =$ Fill height from top of floor, $H =$ Weight of content, $W_t = 22/7 \cdot (D/2)^2 \cdot H \cdot 62.4 \text{ pcf} / 1000 =$ Weight of shell, uncorroded, $W_s =$ Weight of roof, $W_r =$ Roof equipment load in seismic, $W_e =$ Ratio of $D / H =$ Weight of roof & equipment load, $W_r = W_r' + W_e =$ Height of center of gravity of shell, $X_s = H / 2 =$ From Figure E-2 Effective masses, $W_1 / W_t = 0.870$ Contents in unison w/ shell, $W_1 = W_t \cdot (W_1 / W_t) =$ From Figure E-2 Effective masses, $W_2 / W_t = 0.186$ First sloshing mode contents, $W_2 = W_t \cdot (W_2 / W_t) =$ From Figure E-3 Centroids of seismic forces, $X_1 / H = 0.431$ Height to centroid, $X_1 = H \cdot (X_1 / H) =$ From Figure E-3 Centroids of seismic forces, $X_2 / H = 0.776$ Height to centroid, $X_2 = H \cdot (X_2 / H) =$ From Figure E-4 Factor k , $k = 0.577$ Natural period of first mode, $T = k \cdot (D)^{0.5} =$ Lateral force coefficient, $C_1 = 0.6$ Lateral force coefficient, $C_2 = C_2 = 0.3S/T =$

0.40	
1.25	
1.50	
1.4	
8.00	ft
11.00	ft
11.00	ft
48.32	kips
1.000	kips
0.500	kips
0.50	kips
0.73	
1.00	Kips
5.50	ft
0.87	
42.06	Kips
0.19	
8.99	Kips
0.43	
4.74	
0.78	
8.54	
0.58	
1.63	seconds
0.24	
0.28	

Base shear $V_s = Z \cdot I \cdot (C_1 \cdot (W_s + W_r + W_1) + C_2 \cdot W_2) =$

6.53 Kips

Overturning, $M_{ot} = Z \cdot I \cdot (C_1 \cdot W_s \cdot X_s + C_1 \cdot W_r \cdot H_t + C_1 \cdot W_1 \cdot X_1 + C_2 \cdot W_2 \cdot X_2) =$

35.96 K-ft

Friction resistance from contents, shell, roof steel, $F_{fric} = 0.4 \cdot (W_t + W_s + W_r) =$

19.93 Kips

Factor of safety for sliding, $FS_s = Fric / V_s =$

3.05 > 1.5 O.K.

Calculate resistance load against overturning:Yield strength of tank material, $F_y =$

6.00 ksi

Thickness of bottom plate, $t_b = \max(t_f - c_o)$, thickness of floor or 0.25 =

0.88

Wt of contents allow for OT calc. per circumference, $W_L = 7.9 t_b (F_y G H)^{0.5} =$

2101.22 plf

Max allowable for $W_L = 1.25 G H D = 154 \text{ plf}$

Use:

154.00 plf

Resistance to OT by contents, $P_r = 22/7 \cdot D \cdot W_L =$

3.87 Kips

Resistance to OT by shell and roof, $P_{sr} = W_s + W_r =$

2.00 Kips

Total resistance to OT moment, $M_r = (P_r + P_{sr}) \cdot D / 2 =$

23.49 k-ft

Mot > Mr, Anchorage required**Wind analysis per API 650 section 3.11 Wind load on Tanks**

Based on 30 psf on vertical plane surface or 22 psf on projected area of cylindrical surface

Wind pressure, $q_w =$

22.00 psf

Base shear from wind, $V_w = q_w \cdot H_t \cdot D =$

1.94 Kips

Overturning due to wind, $M_{otmw} = V_w \cdot H_t / 2 =$

10.65 K-ft

Wind pressure from 2001CBC, $P_w = C_e C_q q_s l_w =$

21.66 psf

For 70 MPH wind, Exp. C Where 22' $C_e = 1.15$ $C_q =$

1.30

70mph $q_s = 12.6$ $l_w =$

1.15

Overturning due to wind from 2001CBC, $M_{otmw} = P_w \cdot H_t \cdot D \cdot H_t / 2 =$

10.48 k-ft

Since Resistance to Overturning of tank < seismic or wind overturning, anchorage req'd.

Design braced beam, support column, base plate and anchor bolts.

$$\begin{aligned} \text{Overturning, } M_o &= Z * I * (C_1 * W_s * X_s + C_1 * W_r * H_t + C_1 * W_1 * X_1 + C_2 * W_2 * X_2) = & 35.96 \text{ k-ft} \\ \text{Base shear } V_s &= Z * I * (C_1 * (W_s + W_r + W_1) + C_2 * W_2) = & 6.53 \text{ Kips} \end{aligned}$$

Design an anchorage steel frame for overturning:

$$S_x \text{ min} = M * 12 * .75 / (.6 * 36) = 11.72 \text{ in}^3$$

Use W 8 x 18 brace beam w/ W8x18 column. Fy = 36 ksi

$$\text{Shear weld at } 3/4" \text{ thick cap plate} = 6.53 / (.928 * 3 * 4/3) = 1.76 \text{ in.}$$

$$\begin{aligned} 1/4" \text{ Weld at base} &= M / 2 * 12 * .75 / (b d + d^2 / 3) = b = 5.25, d = 8.125 & 2.50 \text{ kli} \\ \text{Cap of } 3/16" \text{ fillet weld} &= .928 * 4 = & 3.712 \text{ kli/in} \end{aligned}$$

$$\text{Tension on the base plate} = M * 12 / (8.125 + 2 + 2) / 6 \text{ bolts} = 5.93 \text{ Kip} < 6$$

$$\text{Shear on } 1" \text{ diameter bolts} = 6.53 / 12 \text{ bolts} = 0.54 \text{ Kips} < 9.2$$

$$\text{Combine shear and tension} = (.54 / 9.2)^{(5/3)} + (5.93 / 6)^{(5/3)} = 0.990 < 1.33$$

$$\text{Base plate thk min} = (6 * 3 * 5.93 * 2 * .75 / (10 * .75 * 36)) + D65^{.5} = 0.593 \text{ in}$$

$$\text{Cap of pullout cone fr 3 bolts} = .55 * .65 * (22/7 * 10^2/4) * (3000)^{0.5 * 4/3 * 3} = 26.59 \text{ Kips O.k.}$$

Use: Cap plate 3/4" x 8 x 9 w/ 3/16" fillet weld, weld flange to cap plate.

Use: Base plate 3/4" x 10 x 1'-4" w/ (6) 1" dia. Hilti Kwik Bolts II, 6" embedment

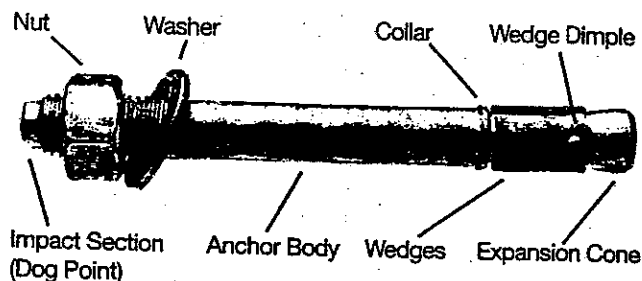
Anchoring Systems

Kwik Bolt II Expansion Anchor

HILTI**4.3.3**

4.3.3.1 PRODUCT DESCRIPTION

The Kwik Bolt II is a stud type expansion anchor with a single piece wedge that performs as three independent wedges if necessary to provide consistent performance in a wide variety of medium-duty applications. Applicable base materials include concrete, lightweight concrete and grout-filled block.



Product Features

- Impact section (Dog Point) prevents thread damage during installation
- Independent 3-piece wedge with dimples help prevent anchor from spinning during installation
- Length identification code facilitates quality control & inspection after installation
- Anchor size is same as drill bit size for easy installation
- Comprehensive performance testing to provide high & consistent performance in concrete, light-weight concrete & grout filled block base materials
- Mechanical expansion allows immediate load application
- Can be installed in bottomless hole, which allows the anchor to be driven flush with the surface after use. Eliminates cutting bolt heads.
- Can be installed through the fixture, improving productivity
- Comprehensive product offering includes many head styles, sizes, carbon steel and stainless steel materials for a variety of applications

Guide Specifications

Expansion Anchors

Expansion anchors shall be stud type with a single piece three section wedge and zinc plated in accordance with ASTM B633. The anchors must meet the description in Federal Specification FF-S-325, Group II, Type 4, Class I for concrete expansion anchors. Anchors shall be Hilti Kwik Bolt II as supplied by Hilti, Inc., P.O. Box 21148, Tulsa, OK 74121.

Installation

Anchors to be installed in holes drilled with Hilti carbide tipped drill bits or matched tolerance diamond core bits. Anchors shall be installed per manufacturer's recommendations.

Listings/Approvals

- Underwriters Laboratory No. 203 "Pipe Hangers" (3/8"-3/4" diameters)
- International Conference of Building Officials (ICBO ES): Evaluation Report No. 4627, KB II
- International Conference of Building Officials (ICBO ES): Evaluation Report No. 5224, HCKB
- Southern Building Code Congress (SBCCI): Report No. 9930
- City of Los Angeles (COLA): Research Report No. 24946
- Conforms to the description in Federal Specification FF-S-325, Group II, Type 4, Class 1
- Factory Mutual (FM) KB II 3/8" x 2 1/4" w/Rod Coupler
- Metro-Dade County Approval 98-0901.13

4.3.3.2 MATERIAL SPECIFICATIONS

Carbon Steel KB II studs conform to ASTM A510 with chemical composition of AISI 1038 except countersunk KB II, KB 3/4" x 12", KB II 1" x 6", KB II 1" x 9" and KB II 1" x 12" which conform to ASTM A108 with chemical composition of AISI 11L41

Wedges are manufactured from AISI 1010 carbon steel, except KB II 3/4" x 12", KB II 1" x 6", KB II 1" x 9" and KB II 1" x 12" wedges which conform to chemical composition of AISI 304

Nuts are carbon steel conforming to ASTM A563 Grade A and meet dimensional requirements of ANSI B18.2.2

Washers are carbon steel conforming to SAE 1005-1033 and meet dimensional requirements of ANSI 18.22.1 Type A Plain

All carbon steel parts are zinc plated in accordance with ASTM B633, Type III Fe/Zn 5

Stainless Steel KB II studs conform to ASTM A276 or ASTM A493 with chemical composition of either AISI 304 or 316 1/4" thru 9/16" over 9/16"

Stainless steel wedges are of the same material grade as bolts or superior.

Nuts are stainless steel conforming to ASTM F594 with chemical composition of either AISI 304 or 316 and meeting dimensional requirements of ANSI B18.2.2 to conform with stud material

Washers are AISI 304 or 316 stainless steel conforming to ASTM A240 to conform with stud material

MECHANICAL PROPERTIES	
f_y ksi (MPa)	min. f_u ksi (MPa)
41 (282)	75 (517)
75 (517)	90 (620)
N/A	N/A
N/A	N/A
N/A	N/A
N/A	N/A
76 (524)	90 (620)
64 (441)	76 (524)

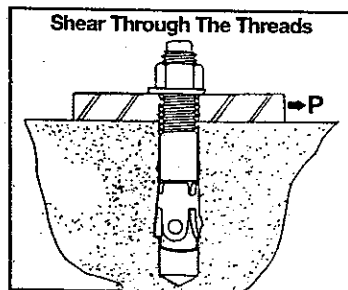
Kwik Bolt II Expansion Anchor

4.3.3

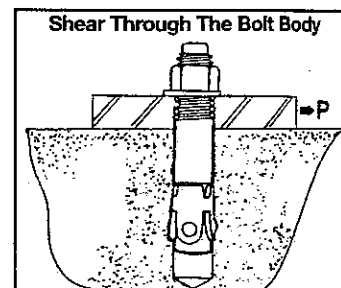
Carbon Steel Kwik Bolt II Allowable Loads in Concrete

Anchor Diameter in. (mm)	Embedment Depth in. (mm)	2000 psi (13.8 MPa)		3000 psi (20.7 MPa)		4000 psi (27.6 MPa)		6000 psi (41.4 MPa)	
		Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
$\frac{1}{4}$ (6.4)	$1\frac{1}{8}$ (29)	270 (1.2)	430 (1.9)	330 (1.5)	430 (1.9)	380 (1.7)	430 (1.9)	470 (2.1)	430 (1.9)
	2* (51)	560 (2.5)	530 (2.4)	590 (2.6)	530 (2.4)	630 (2.8)	530 (2.4)	670 (3.0)	530 (2.4)
	$3\frac{1}{4}$ * (95)	670 (3.0)		670 (3.0)		670 (3.0)			
$\frac{3}{8}$ (9.5)	$1\frac{1}{8}$ (41)	530 (2.4)	990 (4.4)	650 (2.9)	1040 (4.6)	750 (3.3)	1100 (4.9)	850 (3.8)	1100 (4.9)
	$2\frac{1}{2}$ * (64)	1200 (5.3)	1470 (6.5)	1290 (5.7)	1470 (6.5)	1370 (6.1)	1470 (6.5)	1550 (6.9)	1470 (6.5)
	$4\frac{1}{4}$ * (108)	1330 (5.9)		1390 (6.2)		1440 (6.4)			
$\frac{1}{2}$ (12.7)	$2\frac{1}{4}$ (57)	1170 (5.2)	1940 (8.6)	1310 (5.8)	1970 (8.8)	1450 (6.4)	1970 (8.8)	1730 (7.7)	1970 (8.8)
	$3\frac{1}{2}$ * (89)	1870 (8.3)	2450 (10.9)	2130 (9.5)	2450 (10.9)	2400 (10.7)	2450 (10.9)	2800 (12.5)	2450 (10.9)
	6* (152)	2080 (9.3)		2310 (10.3)		2530 (11.3)			
$\frac{5}{8}$ (15.9)	$2\frac{1}{4}$ (70)	1600 (7.1)	3070 (13.7)	1870 (8.3)	3070 (13.7)	2130 (9.5)	3070 (13.7)	2670 (11.9)	3070 (13.7)
	4** (102)	2400 (10.7)	3840 (17.1)	2850 (12.7)	3840 (17.1)	3290 (14.6)	3840 (17.1)	4190 (18.6)	3840 (17.1)
	7** (178)	3200 (14.2)		3470 (15.4)		3730 (16.6)			
$\frac{3}{4}$ (19.1)	$3\frac{1}{4}$ (83)	1970 (8.8)	4140 (18.4)	2320 (10.3)	4140 (18.4)	2670 (11.9)	4140 (18.4)	3200 (14.2)	4140 (18.4)
	$4\frac{1}{4}$ ** (121)	2930 (13.0)	5120 (22.8)	4130 (18.4)	5120 (22.8)	4800 (21.4)	5120 (22.8)	5870 (26.1)	5120 (22.8)
	8** (203)	4000 (17.8)		4930 (21.9)		5870 (26.1)		6320 (28.1)	
1 (25.4)	$4\frac{1}{2}$ (114)	3330 (14.8)	7070 (31.4)	4050 (18.0)	7600 (33.8)	4670 (20.8)	8140 (36.2)	5070 (22.6)	9200 (40.9)
	6 (152)	4930 (21.9)	9200 (40.9)	6000 (26.7)	9200 (40.9)	7070 (31.4)	9200 (40.9)	8400 (37.4)	
	9 (229)	6670 (29.7)		7670 (34.1)		8670 (38.6)		10670 (47.5)	

* Values shown are for a shear plane acting through the anchor bolt body. When the shear plane is acting through the anchor bolt threads, reduce the shear values by 20%.

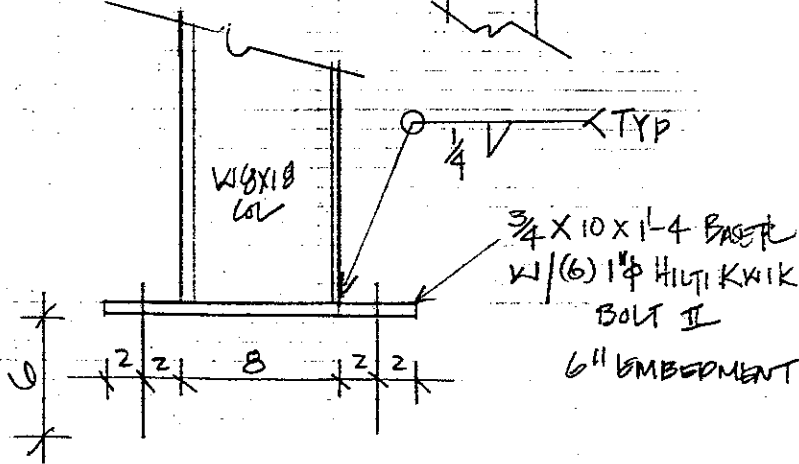
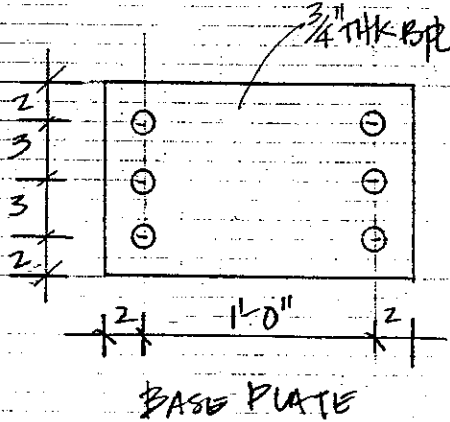
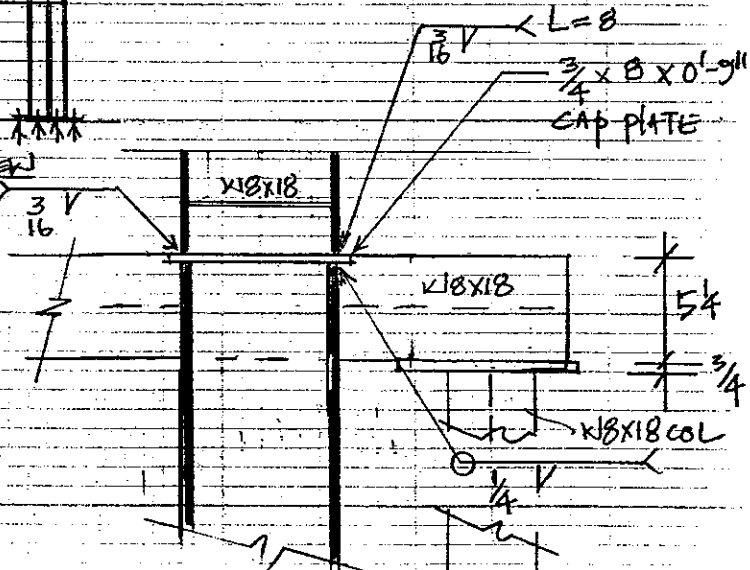
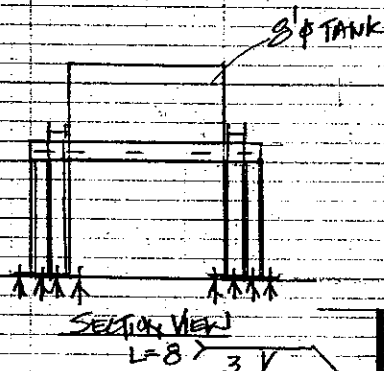
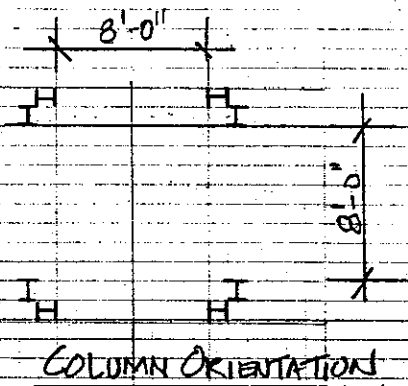
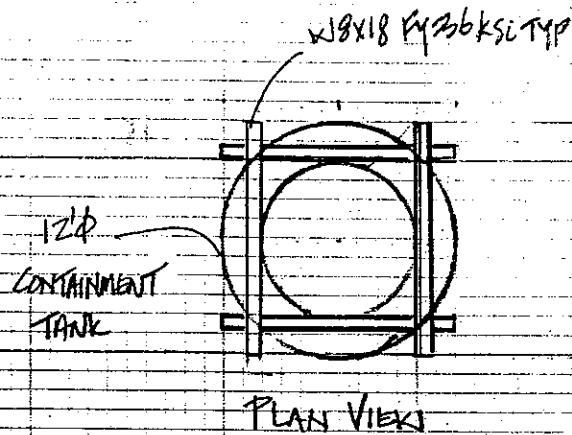


** Values shown are for a shear plane acting through the anchor bolt body. When the shear plane is acting through the anchor bolt threads, reduce the shear value by 12%.



All other values shown are for shear plane acting through either body or threads.

TANK T-132 AND T-136

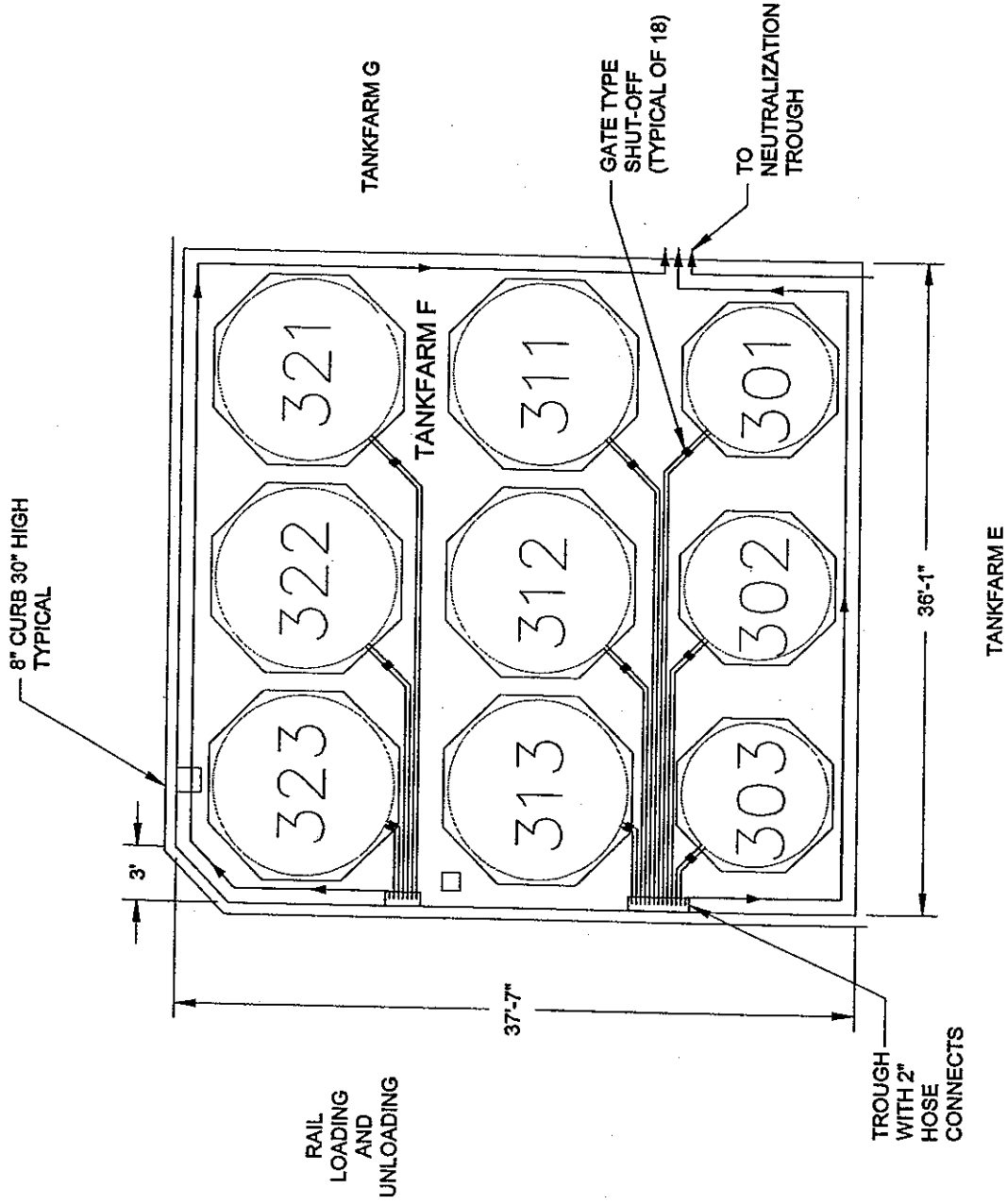
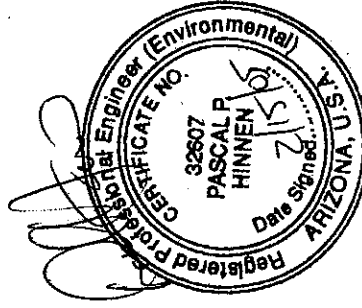




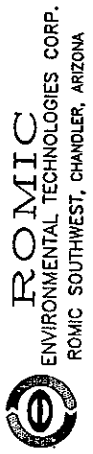
APPROXIMATE



SCALE IN FEET



REFERENCE: BASEMAP PROVIDED BY:



Proposed Tankfarm F

Romic - Southwest
Chandler, Arizona

Figure D-10



Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-108 and TK-109

Weight: 4,000± lbs. Empty

Location: Tank Farm D

81,400± lbs. Full

Service: Waste Receiving/Storage

Temp (°F) Ambient

Contents: Organic/aqueous

Pressure (Psig): ATM

Size: 5,800 gal. S.G.: 1.0–1.6

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: Carbon Steel

Support: 4 Legs

Method of Construction: Welded

Insulation: n/a Agitator: n/a

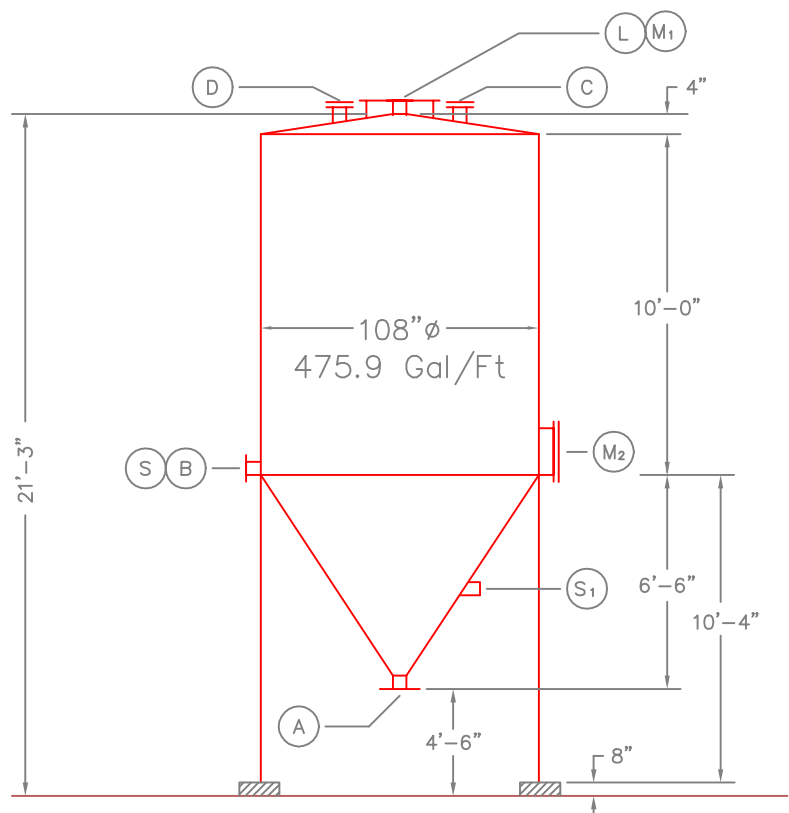
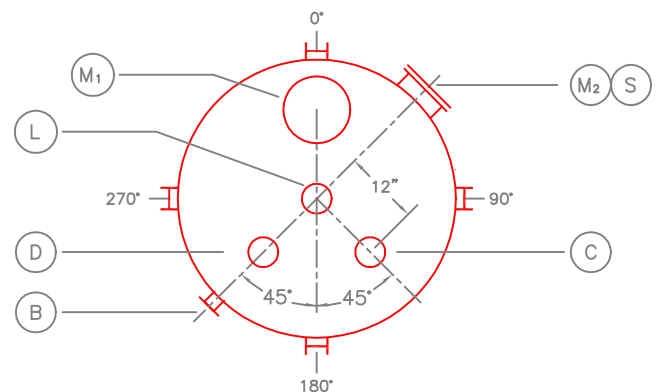
Auxiliary Equip: Cooling Coils

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	3"	RF	150#	SIDE OUTLET
C	3"	RF	150#	VENT
D	3"	RF	150#	SPARE
L	3"	RF	150#	LEVEL INDICATOR
M ₁	24"	FF	n/a	TOP MANWAY
M ₂	24"	FF	n/a	SIDE MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard 1:12 sloped top.
2. Bottom cone with 70.2° included angle.
3. Tank supported on 4 legs.
4. See Brown Tank & Steel W/O-3882.



Rev No.	Revision	By	Date	Apprvd	Date	 ROMIC ENVIRONMENTAL TECHNOLOGIES CORP. ROMIC SOUTHWEST, CHANDLER, ARIZONA
1	ADD TANKS 106 TO 108	MW	11-13-95			
2	Update for 2004 Part B	RP	4-14-04	WK	4-04	
3	Revise Temperature rating	RP	8-22-05	MS	8-05	
Drawing Number Tk 108 and Tk 109						

Project Name: ROMIC SOUTHWEST — Chandler, AZ

Tank I.D.No. TK-137 and TK-138

Weight: 8,000± lbs. Empty

Location: Tank Farm D

235,700± lbs. Full

Service: Fuels/Solvents

Temp (°F) AMB.

Contents: Fuels

Pressure (Psig): ATM.

Size: 19,500 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: Carbon Steel

Support: Skirt

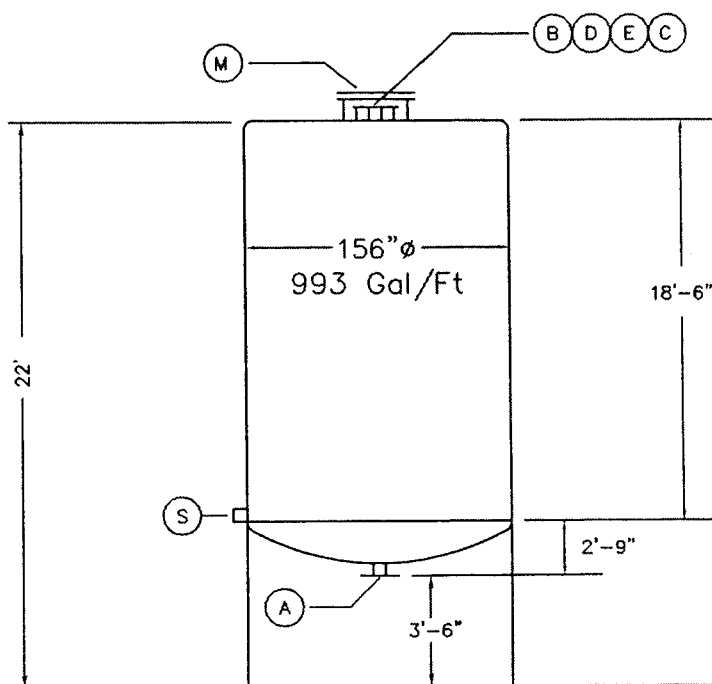
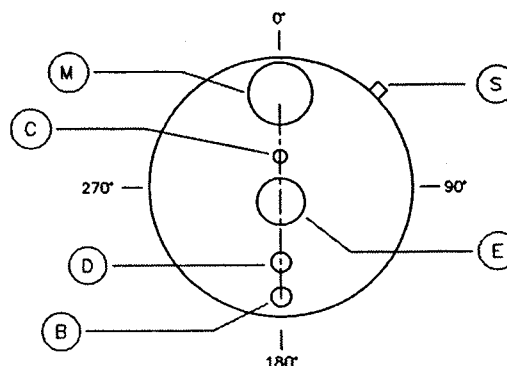
Method of Construction: Welded

Insulation: n/a Agitator: 10 HP

Other: Agitator w/ Baffles Optional

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT



REMARKS

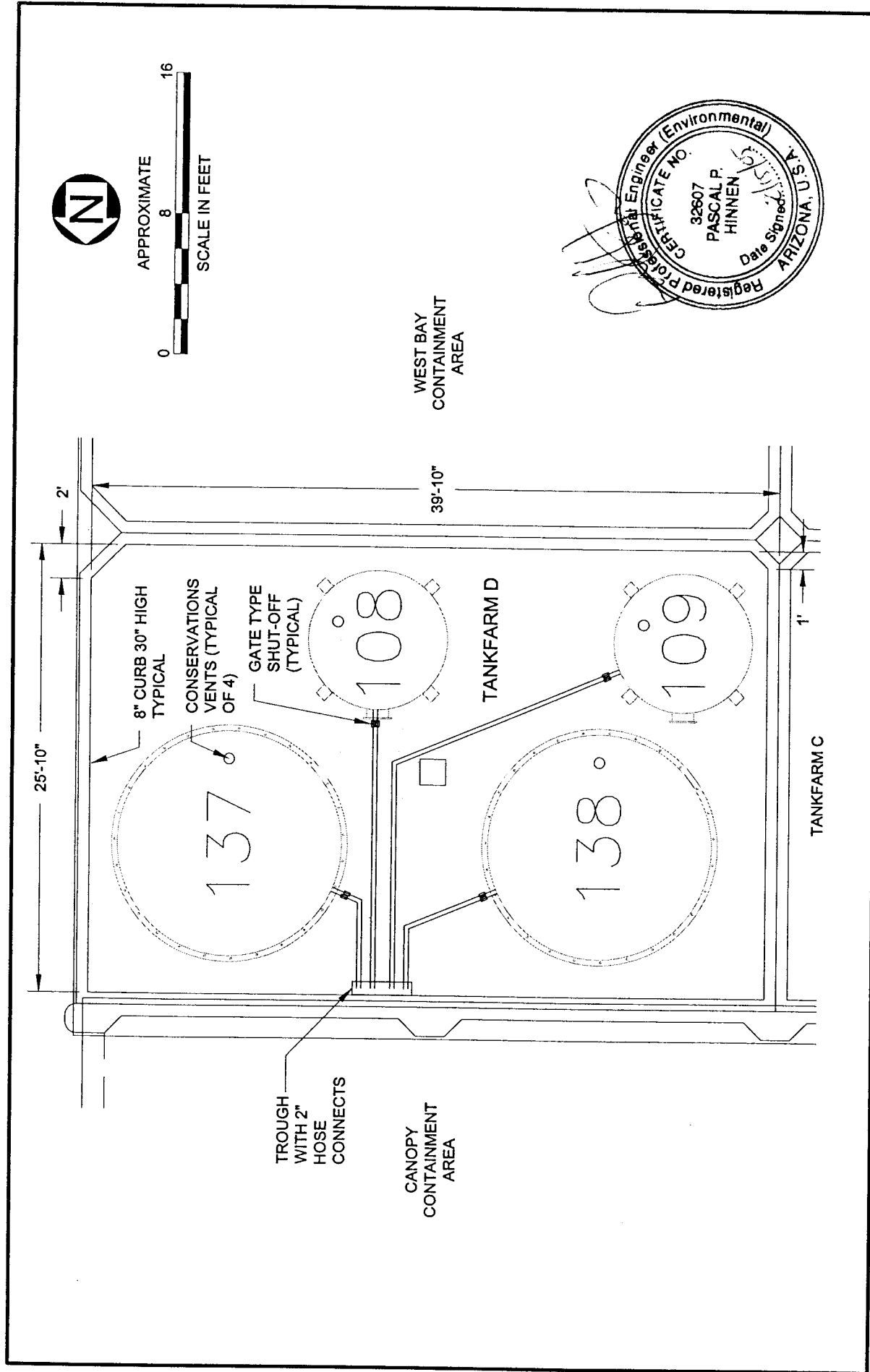
1. Standard Flat top.
2. Flanged and dished bottom
3. Tank supported on ring skirt.
4. See Brown Tank & Steel W/O-3882.

Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2001 Part B	RP	4-14-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number TK 137 and TK 138



Proposed Tankfarm D

Romic - Southwest
Chandler, Arizona

Figure D-8

REFERENCE: BASEMAP PROVIDED BY:

ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

URS

P:\ROMIC\CADD\FIGURES\16433.DWG 02-04-05
XREF: P:\ROMIC\CADD\FIGURES\ROMIC-SITE.DWG

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-401 to TK-403

Weight: 1,000± lbs. Empty

Location: Tank Farm E

49,000± lbs. Full

Service: Waste Storage

Temp (°F) AMB.

Contents: Alkaline waste

Pressure (Psig): ATM.

Size: 4,100 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: High density polyethylene

Support: Sloped Bottom

Method of Construction: Molded

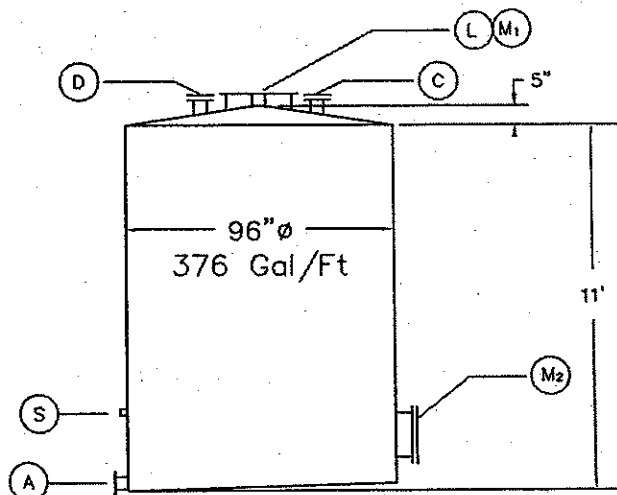
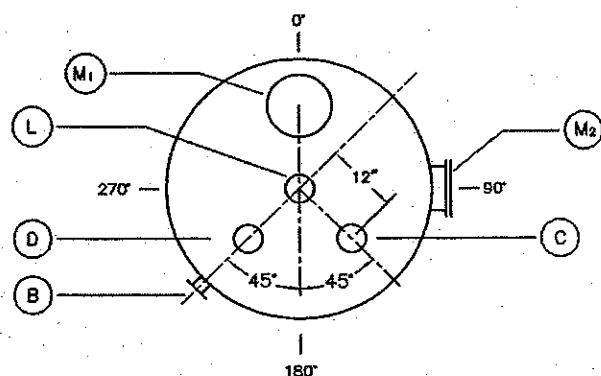
Insulation: n/a Agitator: n/a

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard cone top
2. Sloped bottom



Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2004 Part B	RP	4-14-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number TK-401 to TK-403

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-411 to TK-413

Location: Tank Farm E

Service: Waste Storage

Contents: Alkaline waste

Size: 8,500 gal. S.G.: 1.0-1.4

Fill GPM: 250 Empty GPM: 250

Support: Sloped Bottom

Insulation: n/a Agitator: n/a

Weight: 2,500± lbs. Empty

101,700± lbs. Full

Temp (°F) AMB.

Pressure (Psig): ATM.

Seismic Zone: 2

Material: High density polyethylene

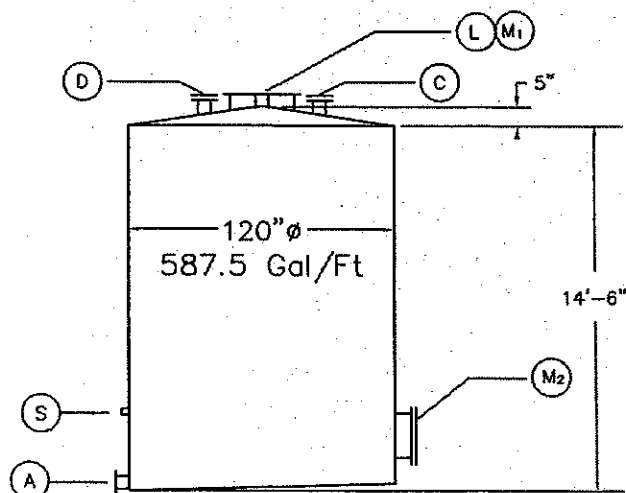
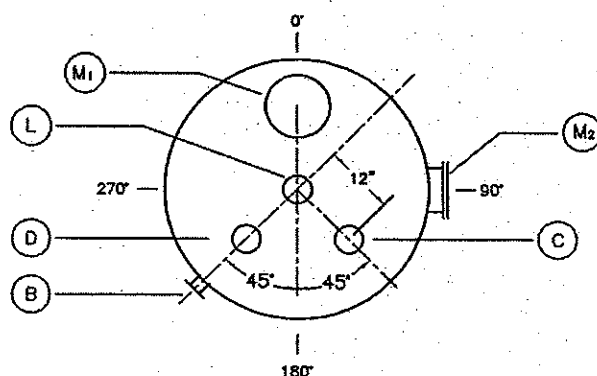
Method of Construction: Molded

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard cone top
2. Sloped bottom

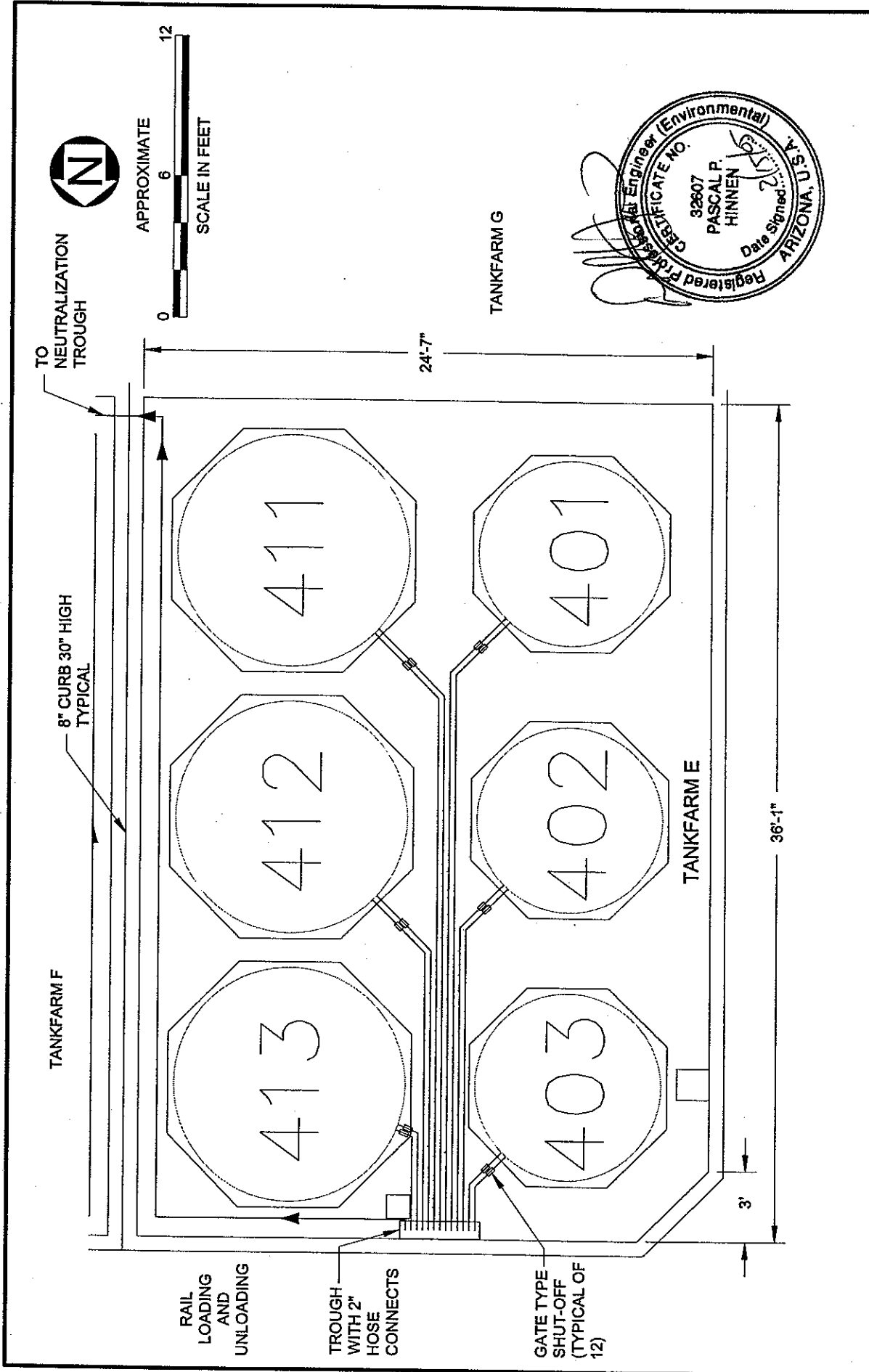


Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2004 Part B	RP	4-14-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number TK-411 to TK-413



Proposed Tankfarm E
 Romic - Southwest
 Chandler, Arizona
 Figure D-9

REFERENCE: BASEMAP PROVIDED BY:
ROMIC
 ENVIRONMENTAL TECHNOLOGIES CORP.
 ROMIC SOUTHWEST, CHANDLER, ARIZONA



Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-301 to TK-303

Weight: 1,000± lbs. Empty

Location: Tank Farm F

49,000± lbs. Full

Service: Waste Storage

Temp (°F) AMB.

Contents: Acid waste

Pressure (Psig): ATM.

Size: 4,100 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: High density polyethylene

Support: Sloped Bottom

Method of Construction: Molded

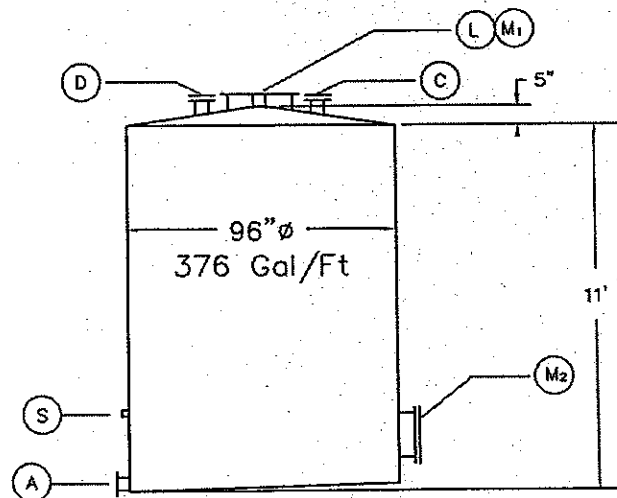
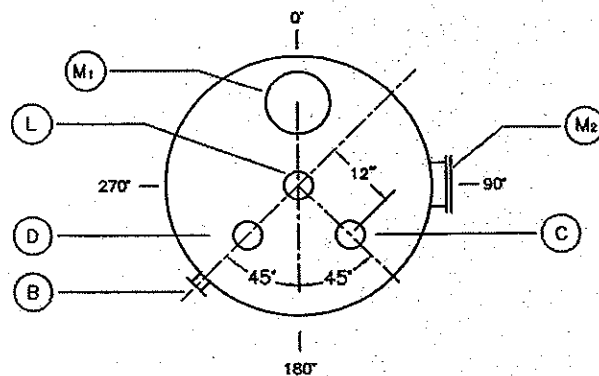
Insulation: n/a Agitator: n/a

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

- Standard cone top
- Sloped bottom



Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2004 Part B	RP	4-14-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number TK-301 to TK-303

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-311 to TK-313

Weight: 2,500± lbs. Empty

Location: Tank Farm F

101,700± lbs. Full

Service: Waste Storage

Temp (°F) AMB.

Contents: Acid waste

Pressure (Psig): ATM.

Size: 8,500 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: High density polyethylene

Support: Sloped Bottom

Method of Construction: Molded

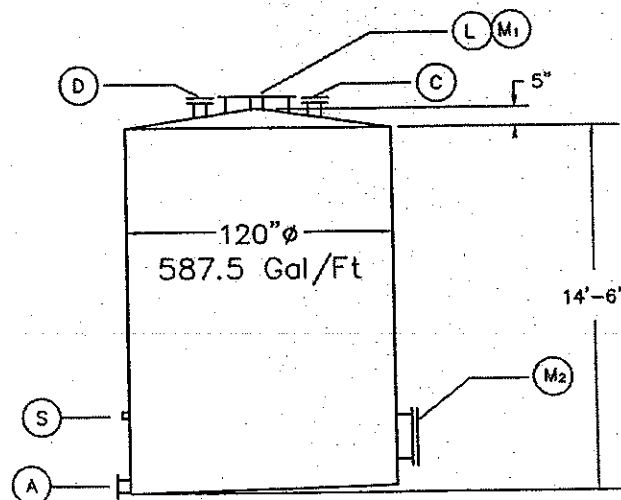
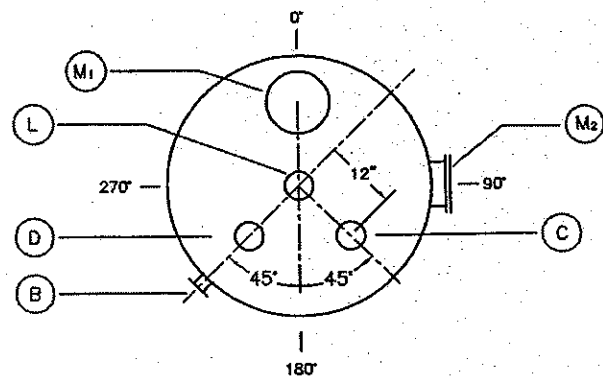
Insulation: n/a Agitator: n/a

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard cone top
2. Sloped bottom



Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2004 Part B	RP	4-14-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number TK-311 to TK-313

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-321 to TK-323

Weight: 2,500± lbs. Empty

Location: Tank Farm F

101,700± lbs. Full

Service: Waste Storage

Temp (°F) AMB.

Contents: Acid waste

Pressure (Psig): ATM.

Size: 8,500 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: High density polyethylene

Support: Sloped Bottom

Method of Construction: Molded

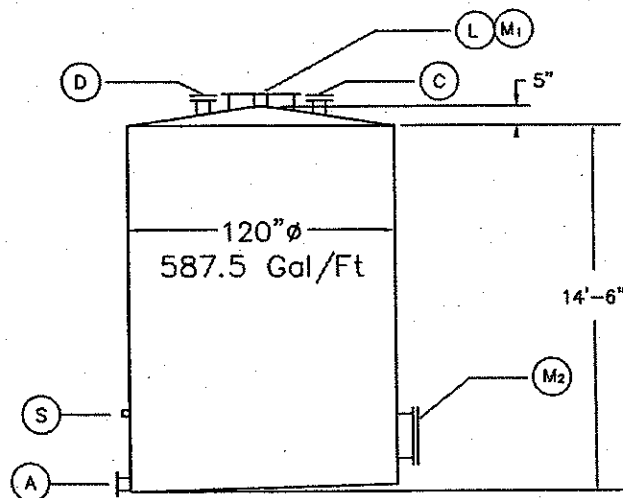
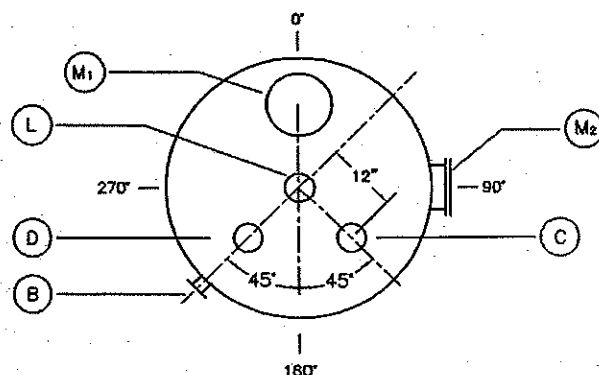
Insulation: n/a Agitator: n/a

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard cone top
2. Sloped bottom



Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2004 Part B	RP	4-14-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

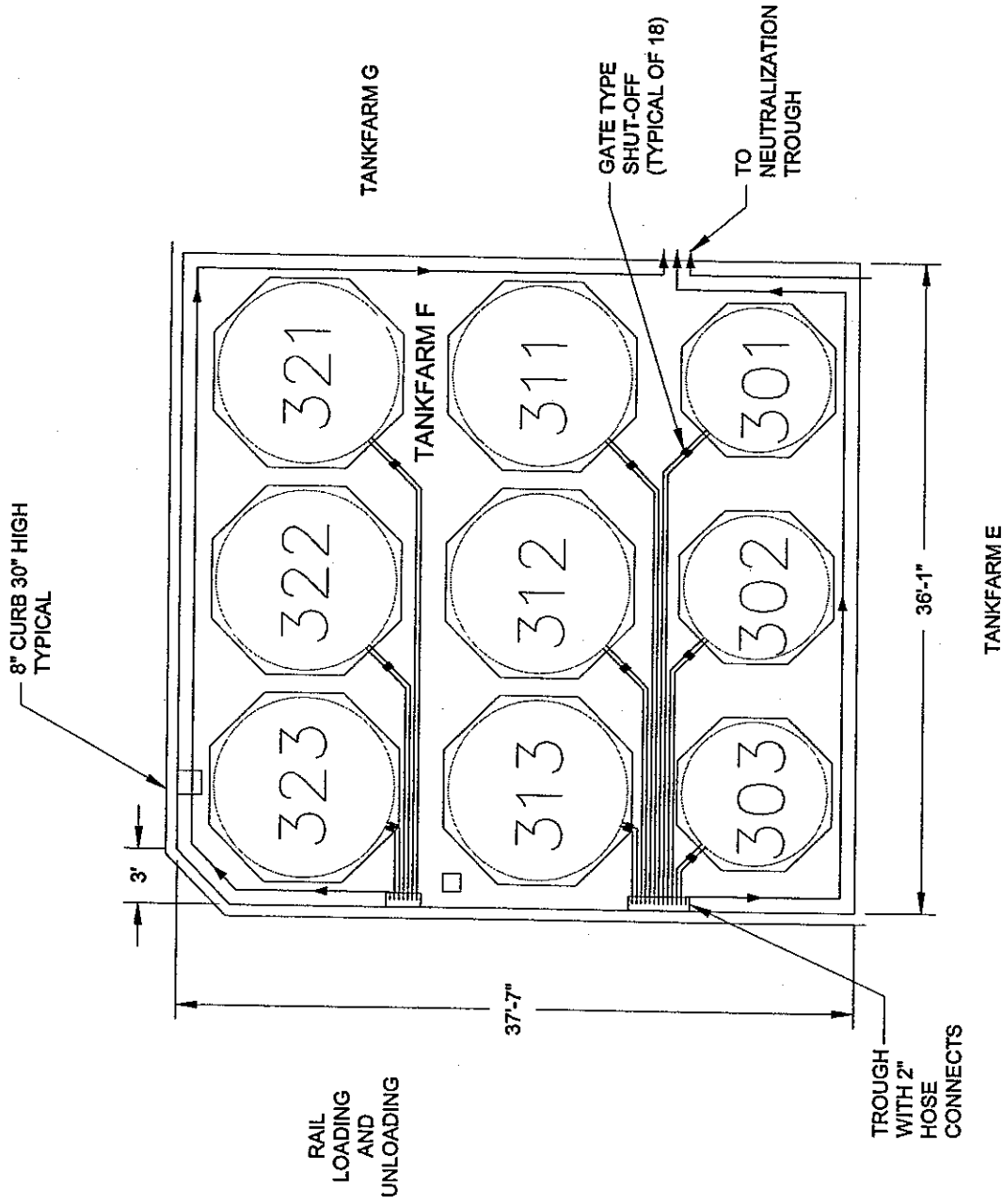
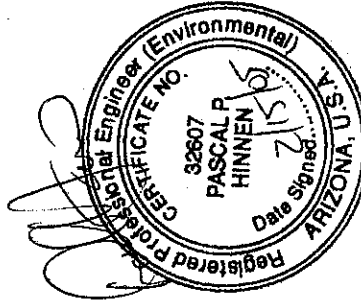
Drawing Number TK-321 to TK-323



APPROXIMATE



SCALE IN FEET



REFERENCE: BASEMAP PROVIDED BY:



Proposed Tankfarm F

Romic - Southwest
Chandler, Arizona

Figure D-10



Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-304 to TK-307

Weight: 1,000± lbs. Empty

Location: Tank Farm G

49,000± lbs. Full

Service: Waste Storage

Temp (°F) AMB.

Contents: Acid, Base, Aqueous, Oxidizer

Pressure (Psig): ATM.

Size: 4,100 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: High density polyethylene

Support: Ring Skirt

Method of Construction: Molded

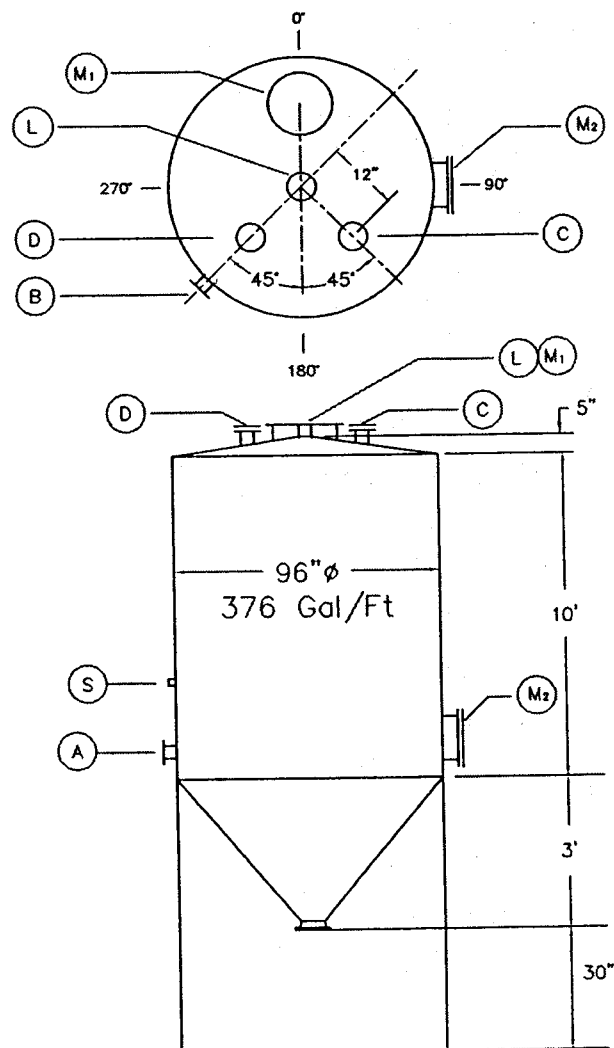
Insulation: n/a Agitator: Yes

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
L	4"	RF	150#	MIXER
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard cone top
2. Sloped bottom



Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2004 Part B	RP	4-14-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number TK-304 to TK-307

Project Name: ROMIC SOUTHWEST — Chandler, AZ

Tank I.D.No. _____

Weight: _____ lbs. Empty

Location: _____

_____ lbs. Full

Service: _____

Temp (°F) _____

Contents: _____

Pressure (Psig): _____

Size: _____ gal. S.G.: _____

Seismic Zone: _____

Fill GPM: _____ Empty GPM: _____

Material: _____

Support: _____

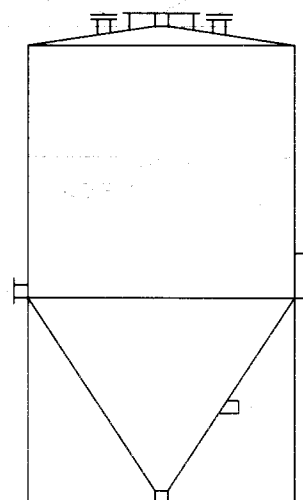
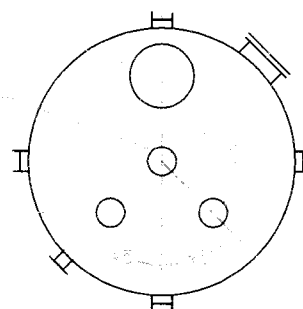
Method of Construction: _____

Insulation: _____ Agitator: _____

CONNECTION

No.	Size	Type	Rating	Function
1	1/2"	RF	150#	Pressure
2	1/2"	RF	150#	Pressure
3	1/2"	RF	150#	Pressure
4	1/2"	RF	150#	Pressure
5	1/2"	RF	150#	Pressure
6	1/2"	RF	150#	Pressure
7	1/2"	RF	150#	Pressure
8	1/2"	RF	150#	Pressure
9	1/2"	RF	150#	Pressure
10	1/2"	RF	150#	Pressure
11	1/2"	RF	150#	Pressure
12	1/2"	RF	150#	Pressure
13	1/2"	RF	150#	Pressure
14	1/2"	RF	150#	Pressure
15	1/2"	RF	150#	Pressure
16	1/2"	RF	150#	Pressure
17	1/2"	RF	150#	Pressure
18	1/2"	RF	150#	Pressure
19	1/2"	RF	150#	Pressure
20	1/2"	RF	150#	Pressure
21	1/2"	RF	150#	Pressure
22	1/2"	RF	150#	Pressure
23	1/2"	RF	150#	Pressure
24	1/2"	RF	150#	Pressure
25	1/2"	RF	150#	Pressure
26	1/2"	RF	150#	Pressure
27	1/2"	RF	150#	Pressure
28	1/2"	RF	150#	Pressure
29	1/2"	RF	150#	Pressure
30	1/2"	RF	150#	Pressure
31	1/2"	RF	150#	Pressure
32	1/2"	RF	150#	Pressure
33	1/2"	RF	150#	Pressure
34	1/2"	RF	150#	Pressure
35	1/2"	RF	150#	Pressure
36	1/2"	RF	150#	Pressure
37	1/2"	RF	150#	Pressure
38	1/2"	RF	150#	Pressure
39	1/2"	RF	150#	Pressure
40	1/2"	RF	150#	Pressure
41	1/2"	RF	150#	Pressure
42	1/2"	RF	150#	Pressure
43	1/2"	RF	150#	Pressure
44	1/2"	RF	150#	Pressure
45	1/2"	RF	150#	Pressure
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94	1/2"	RF	150#	Pressure
95	1/2"	RF	150#	Pressure
96	1/2"	RF	150#	Pressure
97	1/2"	RF	150#	Pressure
98	1/2"	RF	150#	Pressure
99	1/2"	RF	150#	Pressure
100	1/2"	RF	150#	Pressure

REMARKS



Rev No.

Revision

By

Date

Apprvd

Date



ROMIC

ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number Tk 308 and Tk 309

Project Name: ROMIC SOUTHWEST – Chandler, AZ

Tank I.D.No. TK-511 to TK-512

Weight: 2,500± lbs. Empty

Location: Tank Farm F

101,700± lbs. Full

Service: Waste Storage

Temp (°F) AMB.

Contents: Wastewater

Pressure (Psig): ATM.

Size: 8,500 gal. S.G.: 1.0-1.4

Seismic Zone: 2

Fill GPM: 250 Empty GPM: 250

Material: High density polyethylene

Support: Sloped Bottom

Method of Construction: Molded

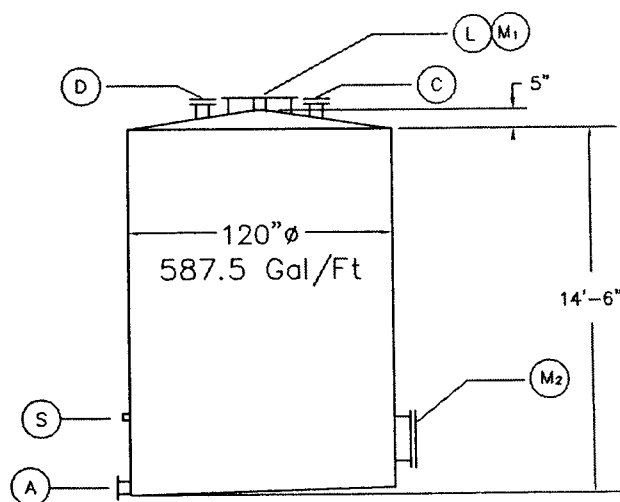
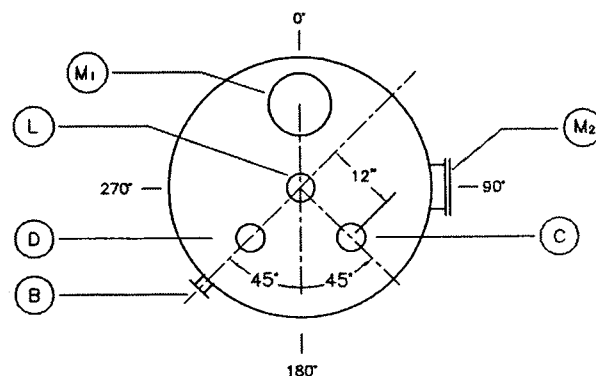
Insulation: n/a Agitator: n/a

CONNECTION

No.	Size	Type	Rating	Function
A	4"	RF	150#	BOTTOM NOZZLE
B	4"	RF	150#	SIDE OUTLET
C	2 1/2"	RF	150#	VENT
D	4"	RF	150#	SPARE
E	12"	RF	150#	LEVEL INDICATOR
M	24"	FF	n/a	TOP MANWAY
S	1"	HC	3000#	SAMPLE PORT

REMARKS

1. Standard cone top
2. Sloped bottom

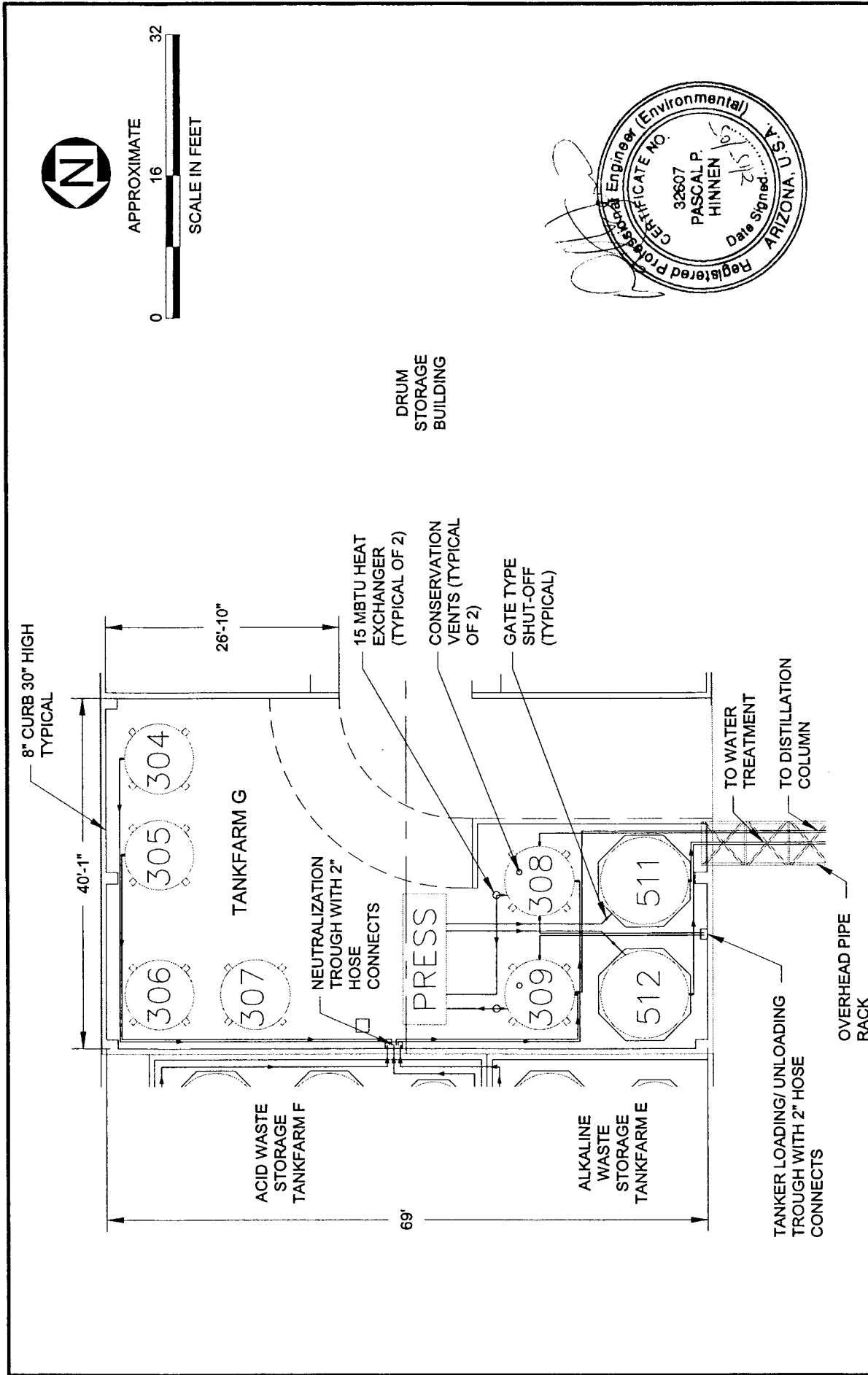


Rev No.	Revision	By	Date	Apprvd	Date
1	Update for 2004 Part B	RP	4-14-04	WK	4-04



ROMIC
ENVIRONMENTAL TECHNOLOGIES CORP.
ROMIC SOUTHWEST, CHANDLER, ARIZONA

Drawing Number TK-511 to TK-512



Proposed Tankfarm G
 Romic - Southwest
 Chandler, Arizona
 Figure D-11

REFERENCE: BASEMAP PROVIDED BY:



