ENGINEERING CERTIFICATION REPORT

STORM SEWER INTERIM REMEDIAL MEASURES
FORMER GE COURT STREET 5/5A SITE

TOWN OF DEWITT, NEW YORK

APPROVED

Prepared for

Lockheed Martin Corporation
Syracuse, New York

November 1997

Prepared by

EMCON/Wehran-New York, Inc.
Crossroads Corporate Center
One International Blvd., Suite 700
Mahwah, New Jersey 07495

Project 86143-004.000

Engineering Certification Report
Storm Sewer Interim Remedial Measure
Former GE Court Street 5/5A Site
Town of Dewitt, New York

I, Mark A. Swyka, certify that, to the best of my knowledge and belief, the Storm Sewer Interim Remedial Measure (IRM) was implemented and all construction activities were completed in accordance with the NYSDEC-approved Storm Sewer IRM Work Plan (June 1997), and subsequent documentation herein referenced. The IRM activities described herein were completed as witnessed by persons under my direct supervision.

Mark A. Swyka, P.E.
NY P.E. License No. 64543

EMCON/Wehran-New York, Inc.
Crossroads Corporate Center
One International Boulevard
Mahwah, New Jersey 07495

CONTENTS

1 INTRODUCTION

This report describes the Storm Sewer Interim Remedial Measure (IRM) activities performed at the Former General Electric Company (GE) Court Street Plant 5/5A (CSP-5/5A) Site in accordance with the relevant documentation referenced in this report. The IRM activities were designed to mitigate groundwater infiltration into the site's storm sewer system which may be the source of volatile organic compounds (VOCs) detected in the storm system outfalls. The IRM activities were performed in accordance with the provisions of Section V of the Order on Consent (Index No. D7-0001-96-05) for the site between the New York State Department of Environmental Conservation (NYSDEC) and Lockheed Martin Corporation (LMC).

The following documents describe the Interim Remedial Measures:

- Storm Sewer IRM Plans, prepared by EMCON/Wehran-New York, Inc., dated June 1997, last revised July 1997.
- Storm Sewer Interim Remedial Measures Work Plan for the Former GE Court Street Building 5/5A in the Town of Dewitt, New York, prepared by EMCON/Wehran-New York, Inc., dated June 1997.
- Site Operations Plan, Storm Sewer Interim Remedial Measures, Former GE Court Street Building 5/5A Site, Town of Dewitt, New York, prepared by The Sear-Brown Group, dated July 1997.
- Storm Sewer Plan, Profile and Cross-Section Sketches, EMCON/Wehran-New York, Inc., August 1997.
- Health and Safety Plan, Former GE Court Street 5/5A Site, prepared by Blasland, Bouck & Lee (BB&L), dated August 1996.
- Site-Specific Health and Safety Plan Addendum No. 1 — Construction Addendum, Former GE Court Street 5/5A Site, prepared by EMCON/Wehran-New York., Inc., dated May 1997.

1.1 Project Background

Previous use of the site by GE, included a number of underground storage tanks (USTs), and a solvent storage pad for storage of virgin solvents and thinners. Subsurface investigations performed in 1992 indicated that volatile organic compound (VOC) impacted soil and groundwater were present at the site, primarily along the western site boundary, adjacent to CSP-5. Three source areas were identified including the former USTs, the solvent storage pad, and an area adjacent to a former metal garage at the southwest corner of CSP-5. In 1992, IRMs were completed to remove contaminated soils from these areas. Groundwater which accumulated in the excavations was also removed from the site.

Confirmatory sampling indicated that the majority of VOC-impacted soils in the former UST area and the former solvent storage pad area were removed, and that complete removal was performed adjacent to the former metal garage. A Remedial Action Plan (RAP) was prepared in 1993, which recommended collection and treatment of groundwater to prevent migration of residual VOCs in groundwater to the South Branch of Ley Creek and to Sanders Creek. This RAP in combination with the previous source (soils) removals was proposed to reduce the volume of VOCs in the site soils and groundwater, and to control the areal migration of impacted groundwater.

The original storm sewer system at the site consisted of bell and spigot, clay tile piping with brick catch basins. This type of construction typically allows infiltration of groundwater into the piping and catch basins. In 1992 and 1993, additional IRM activities related to the storm sewer system, were completed to prevent groundwater infiltration from VOC-impacted areas. These activities included abandonment and relocation of catch basins, grouting of existing sections of clay tile piping, and installation of new storm sewer piping. Post-IRM sampling of the outfalls confirmed that the IRMs were successful in mitigating the infiltration of VOCs to the storm system at that time.

Subsequent storm sewer outfall sampling (performed in March 1997 as part of a Remedial Investigation/Feasibility Study (RI/FS) for the site) indicated that low-level VOCs were present in the Sanders Creek and the South Branch of Ley Creek storm sewer outfalls, as described below. This information was utilized to develop the Storm Sewer IRM Work Plan (EMCON/Wehran-New York, Inc., June 1997), which was approved by the NYSDEC in a letter dated July 27, 1997. A copy of the NYSDEC approval is contained in Appendix A — Project Correspondence.

1.1.1 Sanders Creek Outfall (OF-01)

Laboratory data from the March 1997 sampling indicated that a total of 269 parts per billion (ppb) of VOCs were detected at this outfall. This data was provided by LMC to the NYSDEC in a letter dated April 22, 1997. The compounds detected in the outfall

(vinyl chloride, 1,1-dichloroethane and 1,2 dichloroethene) were also detected in MW-16S. MW-16S is located adjacent to the storm sewer line between catch basins CB-3 and CB-4. This segment of storm sewer was not replaced during IRMs conducted at the site in 1992 and 1993. The construction of this segment of storm sewer is bell and spigot clay tile pipe which may allow infiltration of groundwater into the storm sewer system.

In order to minimize or eliminate the impacts of any groundwater infiltration to OF-01 from the storm sewer between CB-3 and CB-4, LMC installed a gasketed pressure plug into the inlet and outlet of CB-3, and an inflatable packer into the inlet of CB-4 in April of 1997. In addition, a gasketed pressure plug was installed in the outlet of CB-2 to prevent stormwater buildup in the pipe between CB-2 and CB-3.

In addition, LMC utilized remote video equipment to observe the condition of the storm sewer piping between CB-4 and outfall OF-01 to identify areas of groundwater infiltration. Although significant gaps were observed at the joints of the bell and spigot clay tile piping along the entire segment, areas of visible groundwater infiltration were limited to the first 25 to 50 feet of pipe north of CB-4.

1.1.2 South Branch of Ley Creek Outfall (OF-02)

Laboratory data from the March 1997 sampling indicated that a total of 44 ppb of VOCs (1,1-dichloroethane, 1,2 dichloroethene, 1,1,1-trichloroethane and trichloroethene) were detected at this outfall. This data was provided by LMC to NYSDEC in a letter dated April 22, 1997. A significant portion of the storm sewer system was replaced as part of an IRM conducted in 1992 and 1993, to eliminate the infiltration of impacted groundwater into the system. Observations of the catch basins in April 1997 indicated that groundwater appeared to enter the system near catch basin CB-5 and the storm sewer lines east and south of CB-7. Although CB-5 was replaced as part of the previous IRM, settling had separated a joint in the manhole which resulted in groundwater seepage into the new system. The portion of storm sewer system east and south of CB-7 was not replaced during the 1992 and 1993 IRMs.

In April 1997, LMC repaired CB-5 to minimize or eliminate the infiltration of groundwater. This temporary repair was completed using a hydraulic cement to seal the joint.

In addition, LMC utilized remote video equipment to observe the condition of the storm sewer piping between CB-1, CB-5, CB-7, CB-10, and outfall OF-02 to identify areas of groundwater infiltration. Groundwater infiltration was not observed in the sections of piping which were replaced during the 1992 and 1993 IRMs. The bell and spigot clay tile piping east and south of CB-7 did show evidence of groundwater infiltration around the joints.

1.2 Introduction of Parties

The following is a list of parties involved in the implementation of the IRM and a brief description of their responsibilities:

- **Lockheed Martin Corporation, Syracuse, New York:** party responsible for completing the IRM under the terms of an Order on Consent with the NYSDEC (Index No. D7-0001-96-05).

- **Laidlaw Environmental Services , Syracuse, New York:** waste management contractor retained by Lockheed Martin Corporation to transport and dispose of project waste materials.

- **Sear-Brown Project Delivery Services, Rochester, New York:** contractor retained by Lockheed Martin Corporation to complete the construction of the Storm Sewer IRM.

- **Marcor Remediation, Inc., Rochester, New York:** subcontractor to Sear-Brown Project Delivery Services responsible for providing the personnel and equipment necessary to perform the excavation, backfilling and compaction, pipe installation, catch basin replacement and installation, gabion installation, existing outfall closure and site restoration.

- **T&G Concrete Pumping Services, Inc., East Syracuse, New York:** subcontractor to Sear-Brown Project Delivery Services responsible for providing the personnel and equipment necessary to grout the existing storm piping.

- **Ballard Construction, Inc., Syracuse, New York:** subcontractor to Sear-Brown Project Delivery Services responsible for providing the personnel and equipment necessary to install the asphalt pavement.

- **EMCON/Wehran-New York, Inc., Mahwah, New Jersey:** engineer retained by Lockheed Martin Corporation to prepare the IRM Work Plans, and to provide construction observation and certification.

- **New York State Department of Environmental Conservation:** governmental authority responsible for approving the Work Plan to conduct the Interim Remedial Measures.

- **Onondaga County Department Of Health:** governmental authority responsible for issuing a Plumbing Control permit necessary to perform IRM construction activities and to inspect the new storm sewer piping.

- **Town of Dewitt, New York:** governmental authority responsible for maintaining the Town water mains, and reviewing submittals related to the installation of IRM storm sewer piping across the Town water main north of the site.

2 STORM SEWER CONSTRUCTION

Construction activities commenced on August 4, 1997, and site restoration activities were completed on August 26, 1997. A project stakeout survey was completed by Sear-Brown prior to commencement of construction activities. Drawings (Drawings Nos. 1 and 2) are provided in this report showing "as-built" conditions of the IRM construction. Shop drawings provided by Sear-Brown are contained in Appendix B — Shop Drawings and Technical Data.

2.1 Excavation

Before excavation began, Sear-Brown-cut the asphalt 4 feet wide along the length of the proposed new storm sewer piping within the fence line.

Excavated material was screened for the presence of VOCs by EMCON using a photoionization detector (PID). Materials with any measurable PID readings above background were segregated in the event that waste testing indicated the need for separate handling. Excavated material was temporarily staged near the excavation. Soils exhibiting the potential for VOC impacts were placed on polyethylene sheeting. Periodically throughout the day, Sear-Brown would load the potentially VOC impacted material into roll-offs, provided by Laidlaw (complete with tarpaulins) and cover them at the end of the day. Excavated material which did not exhibit the potential for VOC impacts was staged near the excavation, and was covered with polyethylene sheeting.

No soils excavated from areas north of the site property line (i.e., the fence line) exhibited the potential for VOC impacts. These soils were staged near the excavation and all were reused as backfill north of the property line.

Open excavations were fenced off every night before leaving the site.

2.2 Storm Sewer Piping

New 8-inch and 10-inch Standard Dimension Ratio (SDR) 35 storm sewer piping was installed. New 8-inch piping was installed between existing CB-3 and the newly installed CB-20. New 10-inch piping was installed between the newly installed catch basins CB-4A and CB-20, and between catch basin CB-20 and outfall OF-01A.

In order to extend the piping from CB-20 to OF-01A, it was necessary to install two SDR 35, 22.5-degree bell/bell connectors at the crossing of a Town of Dewitt water main and Onondaga County sanitary sewer (both oriented east-west, approximately 15 feet north of the property boundary). This crossing technique was reviewed and approved by the Town of Dewitt, Onondaga County and the NYSDEC prior to installation.

All other piping was installed in the locations and to the required lines and grades as shown on the Construction Plans and stated in the Technical Specifications. All piping was placed on a surveyed 6-inch compacted bedding. The interior of the pipe ends, joint surfaces and gaskets, were thoroughly cleaned before joining. Invert elevations were checked every pipe length to verify the slope of the pipe. Backfill was placed in compacted lifts above the pipe, and an 8-inch crushed stone subbase (in paved site areas) was placed on top of the backfill and compacted.

2.3 Catch Basin Installation, Replacement, and Repair

New pre-cast, one-piece design catch basins were installed as part of the IRM. Catch basin CB-4A was installed 2 feet east of and replaced existing catch basin CB-4. The outlet invert elevation of the new CB-4A was set to provide drainage to the new CB-20. CB-4 was later abandoned in place by filling with cement. Existing catch basin CB-5 was removed and replaced.

All catch basins were installed in the locations and to the required lines and grades as shown on the Construction Plans and stated in the Technical Specifications. Each catch basin was placed on a surveyed crushed stone bedding. In order to confirm the placement, Sear-Brown checked the catch basin with a level. The backfilling procedures were similar to those used for the pipe. Once the catch basin was backfilled, Sear-Brown installed a raised concrete bench up to the invert of the inlet and outlet.

2.4 Seepage Collars

Seepage collars were installed every 50 feet along the pipe, to minimize lateral groundwater flow through the pipe backfill. The construction of the seepage collars included the placement of a gasket around the circumference of the pipe and building formwork, from the bottom of the trench on each side of the gasket extending to the trench sidewalls. Concrete was then placed into the top of the formwork and allowed to cure prior to backfill.

2.5 Outfall

A new outfall (OF-1A) was installed to replace the existing OF-01. The storm drainage pipe was extended out through a gabion wall, installed to support the channel embankment. The base of the gabion wall was placed below the outfall. Gabions were extended on either side of the outfall from the base. Rip-rap was placed at the base and sides of the gabion wall.

2.6 Storm Drain Abandonment

Storm drain abandonment was completed using tremie grouting methods. Existing storm piping from CB-3 to CB-4, and from CB-4 to OF-01 was grouted by introducing the tremie hose into the outlet pipe at each catch basin location, then pumping grout into the pipe until it flowed back out. The hose was then withdrawn, while still pumping grout to prevent formation of void spaces, until the tremie was removed. The grouting equipment was then moved to the lower end of each pipe section (i.e., inlet of CB-4 and OF-01) and the same procedure was followed. At OF-01, an earthen berm was temporarily formed to prevent loss of grout to Sanders Creek. Immediately after completing the grouting from the OF-01 location, a mechanical plug was installed to prevent any loss of grout.

In order to evaluate effectiveness of the grout placement, a comparison of pipe volume and installed grout was made. The volume of the piping sections between CB-3 and CB-4 and from CB-4 to OF-01, was calculated to be 5.3 cubic yards. Material delivery records were reviewed and confirmed that more than 6 yards of grout was placed in these piping sections. Based on this, adequate grout was introduced to seal these pipes properly.

In addition, a number of small diameter lateral drainage lines were encountered during trench excavation through the paved areas of the work. Each of these lines were grouted from the trench end and plugged with a mechanical plug to prevent loss of grout.

2.7 Site Restoration

Site restoration was completed in accordance with the Construction Drawings and Technical Specifications. Paved areas were restored by installation of hot asphalt pavement (4-inch binder course and 1.5-inch top course). Vegetated areas (i.e., north of the property line) were restored by installation of topsoil and grass seed and mulch. Excess crushed stone from the IRM project was used to improve an access road across the IRM project north of the property line.

2.8 Modifications During Construction

No major modifications to the IRM design were made during construction. Modifications which were made include the piping changes to complete the utility crossing (i.e., Town of Dewitt water main and Onondaga County sanitary sewer, see Section 2.2 and Appendix A), the in-place abandonment of catch basin CB-4 (see Section 2.3 and Drawing No. 1), and the grouting of small diameter lateral drainage lines encountered during excavation work (see Section 2.6).

3 CONFIRMATORY SAMPLE RESULTS

As required in the Storm Sewer IRM Work Plan, confirmatory post-construction sampling was performed on September 5, 1997 to evaluate the effectiveness of the IRM to control impacted groundwater infiltration to the storm sewer system at the site. NYSDEC personnel also collected split samples.

No sample was obtained from the outfall to Sanders Creek (OF-01A), due to the absence of dry weather flow. The observation by EMCON and NYSDEC personnel of the absence of dry weather flow at OF-01A confirms that the IRM was successful in preventing infiltration of groundwater to the northwestern site storm drainage system during the September 1997 water table level. As required in the Storm Sewer IRM Work Plan, the absence of dry weather flow will be confirmed again under high water table conditions in the Spring of 1998.

Post-construction dry weather flow samples (infiltrating groundwater only) were collected from the outfall to the South Branch of Ley Creek (OF-02). As shown below, the sample results indicate lower concentrations of VOCs in discharges to the South Branch of Ley Creek outfall, as compared to RI samples collected in March 1997 (prior to IRM construction).

Compound	March 1997 (Pre-IRM) Concentration (ug/l)	September 1997 (Post-IRM) Concentration (ug/l)
1,1-Dichloroethene	2 UJ	0.8 J
1,1-Dichloroethane	29 J	12
c-1,2-Dichloroethene	2 J	0.5 J
1,1,1-Trichloroethane	5 J	2
Trichloroethene	8 J	0.5
Total Detected	**44**	**15.8**

Notes: "J" denotes an estimated value, "U" denotes a compound which was not detected at the stated detection limit.

The full laboratory analytical report, for the post-construction samples collected by EMCON/Wehran-New York, Inc., is contained in Appendix D of this report. The NYSDEC split sample was determined to have slightly lower concentrations. A copy of the NYSDEC analytical data is contained in Appendix A.

4 RECOMMENDATIONS

The storm sewer IRM met the objective of minimizing or eliminating the infiltration of VOC-impacted groundwater to the site storm sewer system. The IRM has resulted in the elimination of groundwater infiltration to the storm sewer system in the northwest portion of the site during the September 1997 water table level, and a minimization of VOC-impacted groundwater infiltration to the system in the southwest portion of the site.

The IRM activities performed on the storm sewer system in the northwest portion of the property (i.e., discharging through outfall OF-01A to Sanders Creek) have resulted in the elimination of groundwater infiltration to that system during the September 1997 water table level, as evidenced by the absence of dry-weather flow at the outfall. As required in the Storm Sewer IRM Work Plan, the absence of dry weather flow at OF-01A will be confirmed again under high water table conditions in the Spring of 1998. In the event that dry weather flow is observed, a sample of the discharge will be collected and analyzed for VOC concentration.

The IRM activities performed on the storm sewer system in the southwest portion of the site (i.e., catch basin CB-5 replacement) have resulted in the elimination of groundwater infiltration to the catch basin, and significantly lower concentrations of VOCs in the dry-weather discharge to the South Branch of Ley Creek. As a point of comparison, the observed post-IRM concentrations are lower than allowable groundwater treatment system effluent limits established by the NYSDEC for the discharge of treated groundwater from the site to either Sanders Creek or the South Branch of Ley Creek. Although these effluent limits were not developed for application to the storm sewer discharge, they provide a context for comparison of the VOC concentration of the discharge.

Based on the completion of previous source removal activities (i.e., 1992 VOC-contaminated soil removal) in this area of the site, and a comparison of VOC concentrations in dry weather discharges to effluent limits developed by NYSDEC for discharges from the groundwater collection and treatment system, no additional construction activities are recommended at this time. However, to verify that VOC concentrations do not significantly increase at the OF-02 outfall, dry weather outfall samples will be collected for VOC analysis in the Spring of 1998, and on a semi-annual basis thereafter until the Feasibility Study is completed for the site. In the event that significantly higher VOC concentrations are detected, additional interim remedial measures will be considered. VOC-impacted dry-weather discharges through the storm sewer will be considered in developing the Feasibility Study for the site.

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

DRAWINGS

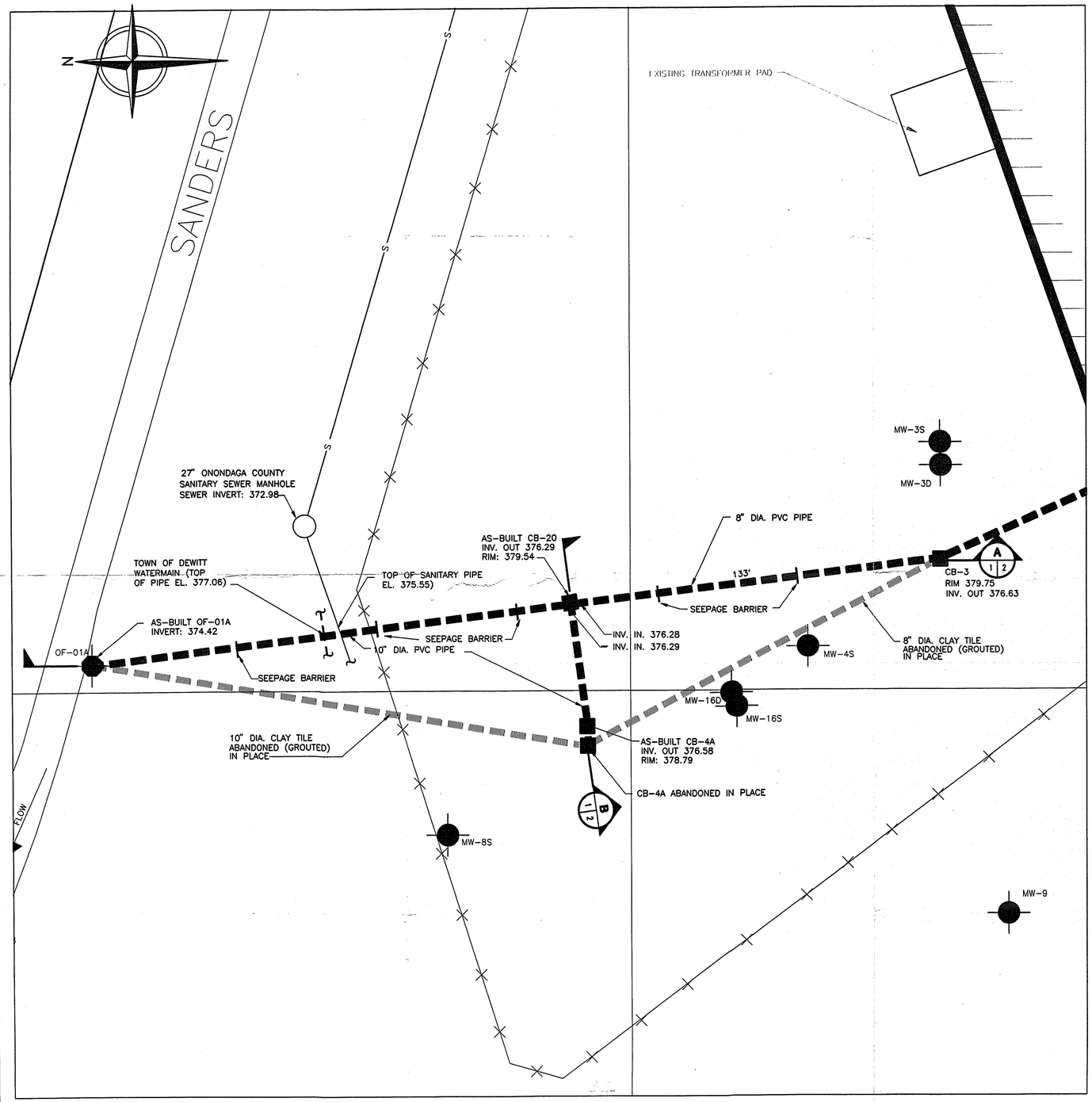
1. AS-BUILT STORM SEWER IRM
2. STORM SEWER PROFILES AND PIPE CROSSING

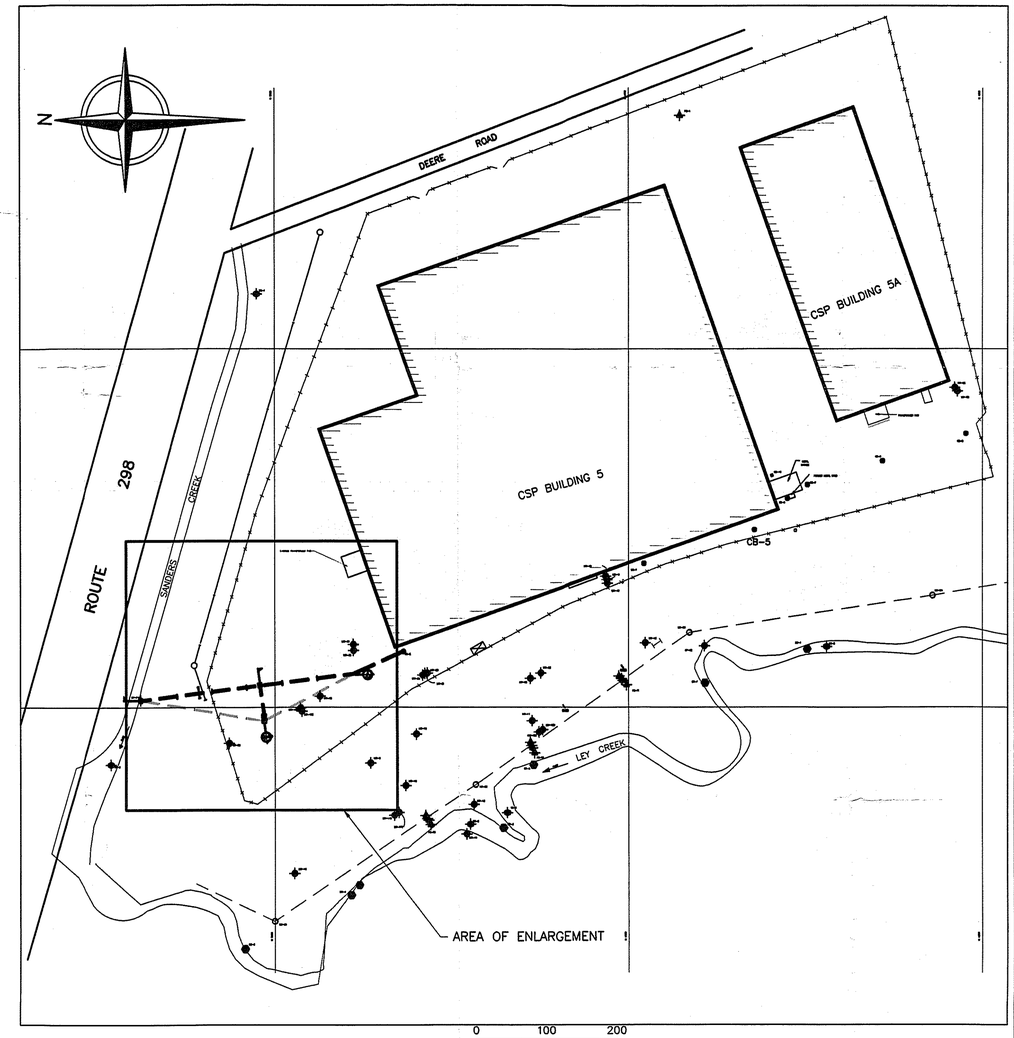
NOTES

1. SURVEY INFORMATION PROVIDED BY MODI ENGINEERING & LAND SURVEYING P.C. FROM FIELD SURVEY PERFORMED ON MARCH 11, 1997 AND JULY 28,1997.
2. RECORD SURVEY INFORMATION PROVIDE BY MODI ENGINEERING AND LAND SURVEYOR P.C. FROM FIELD SURVEYOR PERFORMED AUGUST 11, 1991 AND OCTOBER 14, 1997.

LEGEND:

- MW — EXISTING MONITORING WELL
- SG — EXISTING STAFF GAUGE
- CB — STORM DRAIN CATCH BASIN
- OF — EXISTING STORMWATER OUTFALL
- EXISTING STORM SEWER LINE
- — S — EXISTING SANITARY SEWER LINE
- ABANDONED STORM SEWER





MARK A. SWYKA, P.E.
N.Y.P.E. Lic. No. 64543 Date

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 11/97 — DWN BY AK — DES BY CT — CHK BY — APP BY

EMCON

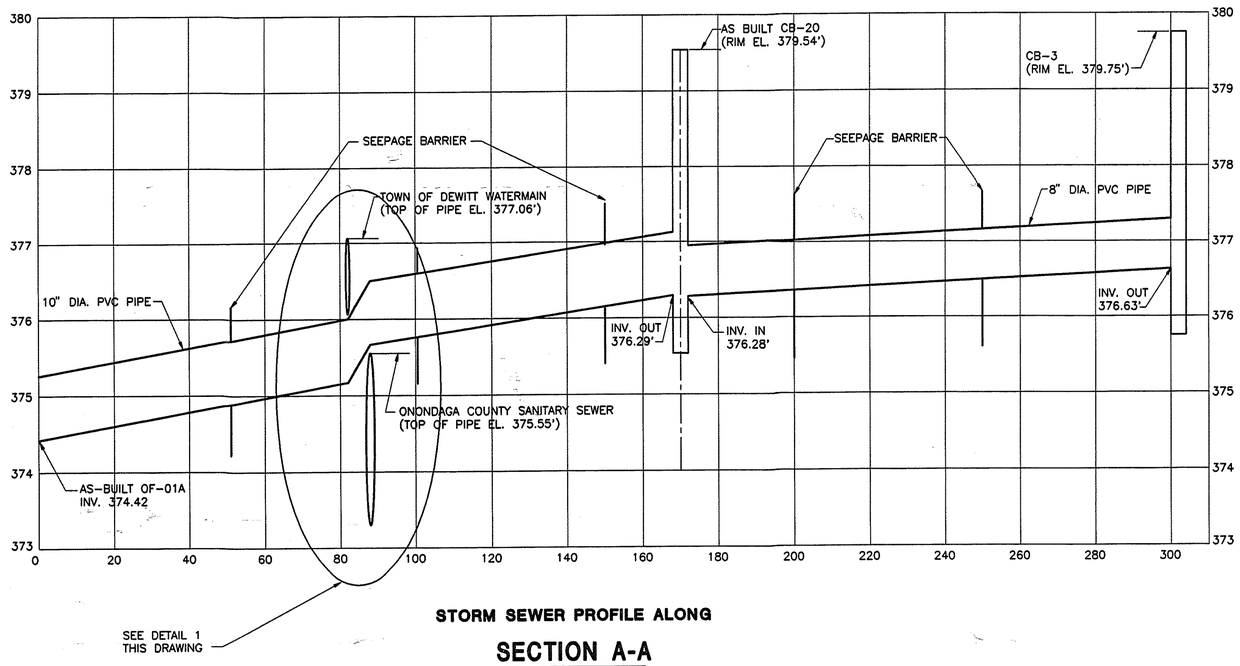
LOCKHEED MARTIN CORPORATION
FORMER GE COURT STREET BUILDING 5/5A
TOWN OF DEWITT, ONONDAGA COUNTY, NEW YORK

AS-BUILT STORM SEWER IRM

DRAWING NO. 1
PROJECT NO. 86143-001.000

1" 1/2" 0" 1"

ENE-MTOWN2/DATA: N:\DWG\86143001\MALMAB01.dwg Xrefs: 24X36, MALMBD01 Scale: 1 = 1.00 DimScale: 1 = 20.00 Date: 11/4/97 Time: 6:36 PM Operator: AKINOSA

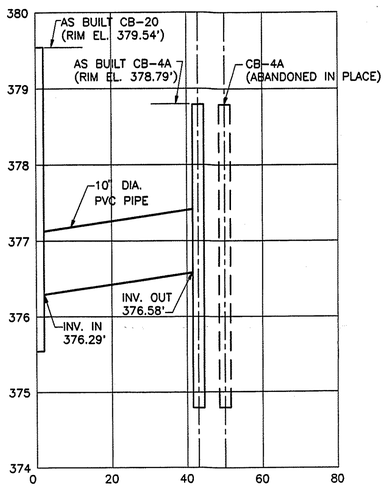


STORM SEWER PROFILE ALONG

SECTION A-A

SCALE: HORIZ. 1"=20'
VERT. 1"=1'

MALMP-04

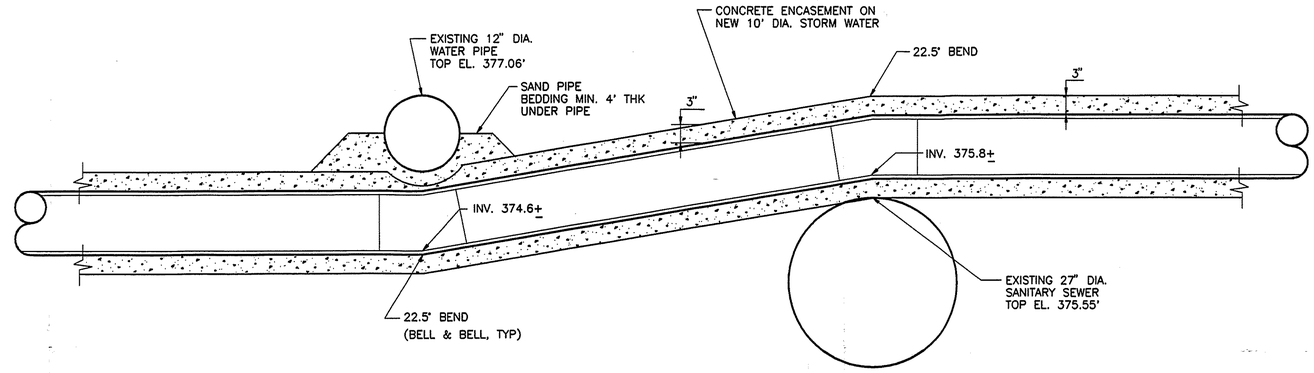


STORM SEWER PROFILE ALONG

SECTION B-B

SCALE: HORIZ. 1"=20'
VERT. 1"=1"

MALMP-03



SECTION AT PROPOSED PIPE CROSSING

DETAIL 1

SCALE: N.T.S.

MALMP-05

MARK A. SWYKA, P.E.
N.Y.P.E. Lic. No. 64543 DATE

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

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EMCON

LOCKHEED MARTIN CORPORATION
FORMER GE COURT STREET BUILDING 5/5A
TOWN OF DEWITT, ONONDAGA COUNTY, NEW YORK

STORM SEWER PROFILES AND PIPE CROSSING DETAIL

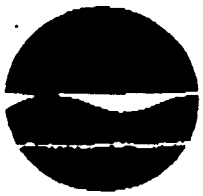
DRAWING NO 2

PROJECT NO 86143-001.00

APPENDIX A

PROJECT CORRESPONDENCE

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010



John P. Cahill
Commissioner

July 9, 1997

Patrick D. Salvador, P.E.
Principal Engineer
Lockheed Martin Corporation
P.O. Box 4840
Syracuse, New York 13221-4840

Re: Former GE Court Street 5/5A Plant (Site ID# 734070)

Dear Mr. Salvador:

The Department has received and reviewed Lockheed Martin's June 24, 1997 submission of the Storm Sewer Interim Remedial Measures Work Plan (Work Plan). The Work Plan is approved contingent upon the following:

1. The Work Plan references a Site-Specific Health and Safety Plan Addendum #1 - Construction Addendum, dated May, 1997, which, at the time of submission of the Work Plan had not been submitted to the Department. Per my request, Lockheed Martin submitted the Health and Safety Plan Addendum on June 27, 1997. The Health and Safety Plan Addendum has been forwarded to the Department of Health for review. The Health and Safety Plan Addendum must be acceptable to the Department of Health prior to commencement of IRM construction.

2. Appendix, Section 01502 - Environmental Protection
This section references two plans to be submitted by the Contractor for assuring environmental protection during IRM implementation; an Implementation Plan and an Erosion Sedimentation Plan. These plans must be submitted to the Department for approval prior to commencement of IRM construction.

3. Section 3 - Confirmatory Sampling
Please revise this section to include two confirmatory sampling rounds (to address high and low flow conditions) for flow from OF-1, just as proposed for OF-2. If, for either outfall, there is no flow present during dry weather flow conditions, then both sampling rounds should occur during high flow conditions.

4. Reuse of Excavated Soils
As we have discussed previously, the criteria for reuse of excavated soils for both proposed IRMs at the Court Street site is as follows:

- Soils with contaminant levels below those listed in TAGM 4046: Determination of Soil Cleanup Objectives and Cleanup Levels may be replaced as backfill, or disposed elsewhere onsite.

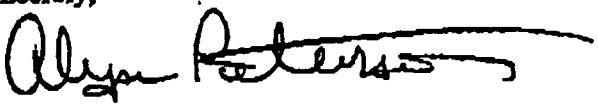
- Soils with contaminant levels which fall between those listed in TAGM 4046 and TAGM 3028: "Contained-In" Criteria for Environmental Media may be reused on site providing Lockheed Martin can demonstrate that the material will be within the influence of the proposed groundwater collection trench IRM.

- Soils with contaminant levels exceeding those listed in TAGM 3028 must be disposed off-site.

Contaminant levels in the excavated soils should be determined through PID field screening with laboratory confirmation.

If you have any questions, feel free to contact me at (518) 457-1641.

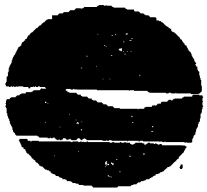
Sincerely,



Alyse Peterson
Environmental Engineer
Bureau of Central Remedial Action
Division of Environmental Remediation

cc: R. Heerkens (NYSDOH)

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010



John P. Cahill
Commissioner

July 29, 1997

Patrick D. Salvador, P.E.
Principal Engineer
Lockheed Martin Corporation
P.O. Box 4840
Syracuse, New York 13221-4840

Re: Former GE Court Street 5/5A Plant (Site ID# 734070)

Dear Mr. Salvador:

This is in response to two recent submissions by Lockheed Martin Corporation (LMC) regarding the Former GE Court Street 5/5A Plant Site. On June 27, 1997, LMC submitted a copy of the Health and Safety Plan - Addendum #1 to account for anticipated site activities related to the storm sewer and groundwater collection and treatment system Interim Remedial Measures. The document has been reviewed by NYSDEC and NYSDOH and is acceptable.

LMC's July 25, 1997 submission provided responses to four items noted in the NYSDEC July 9, 1997 contingent approval of the Storm Sewer Interim Remedial Measures (IRM) Work Plan, and presented the names of those contractors which LMC would like to use to complete the IRM construction activities. LMC's responses to the contingencies and proposed IRM contractors are acceptable.

If you have any questions, feel free to contact me at (518) 457-1641.

Sincerely,

Alyse Peterson

Alyse Peterson
Environmental Engineer
Bureau of Central Remedial Action
Division of Environmental Remediation

cc: H. Hamel (NYSDOH)
A. Heas (USEPA)

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

John P. Cahill
Commissioner

August 5, 1997

Patrick D. Salvador, P.E.
Principal Engineer
Lockheed Martin Corporation
P.O. Box 4840
Syracuse, New York 13221-4840

Re: Former GE Court Street 5/5A Plant (Site ID# 734070)

Dear Mr. Salvador:

The Department has reviewed Lockheed Martin's July 28, 1997 submission of the Storm Sewer Interim Remedial Measure Site Operations Plan which was referenced in the Storm Sewer Interim Remedial Measure Work Plan. The Site Operations Plan is acceptable as submitted, and is approved.

If you have any questions, feel free to contact me at (518) 457-1641.

Sincerely,

Alyse Peterson
Environmental Engineer
Bureau of Central Remedial Action
Division of Environmental Remediation

cc: H. Hamel (NYSDOH)

O'BRIEN & GERE
ENGINEERS, INC.

August 15, 1997

Kurt Taylor
EMCON
One International Boulevard, Suite700
Mahwah, New Jersey 07495

RE: Court Street Road/Lockheed Martin Storm Sewer Installation

FILE: 123.623

Dear Mr. Taylor:

We have reviewed the Plans provided by your office for the installation of a storm sewer on the Lockheed Martin facility on Court Street Road between Ridings and Deere Roads in the Town of DeWitt. The storm sewer is proposed to cross a 27-inch sanitary sewer and 12-inch water main. The water main is owned by the Town of DeWitt while the sanitary sewer is a facility of Onondaga County.

We have discussed the proposed plan with the Superintendent of the Town Water Department, Mathew Reynolds. Mr. Reynolds has indicated if the main is cast iron, the proposed storm sewer and concrete encasement can be installed as modified below but if the main is transite/asbestos cement, the main should be relocated by Town forces. According to your office, the main is cast iron. Therefore, the proposed plan should be modified to reduce the thickness of the concrete encasement to allow for installation of a 4-inch stone bedding beneath the water main. Also, please note our records show the main as a 12-inch diameter water main.

We recommend you contact Mr. Art Russell of the Onondaga County Department of Drainage and Sanitation to coordinate the crossing with the 27-inch sanitary sewer.

If you have any questions or comments regarding this matter, please do not hesitate to contact us.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

Mark C. Parrish, P.E.
Senior Project Engineer

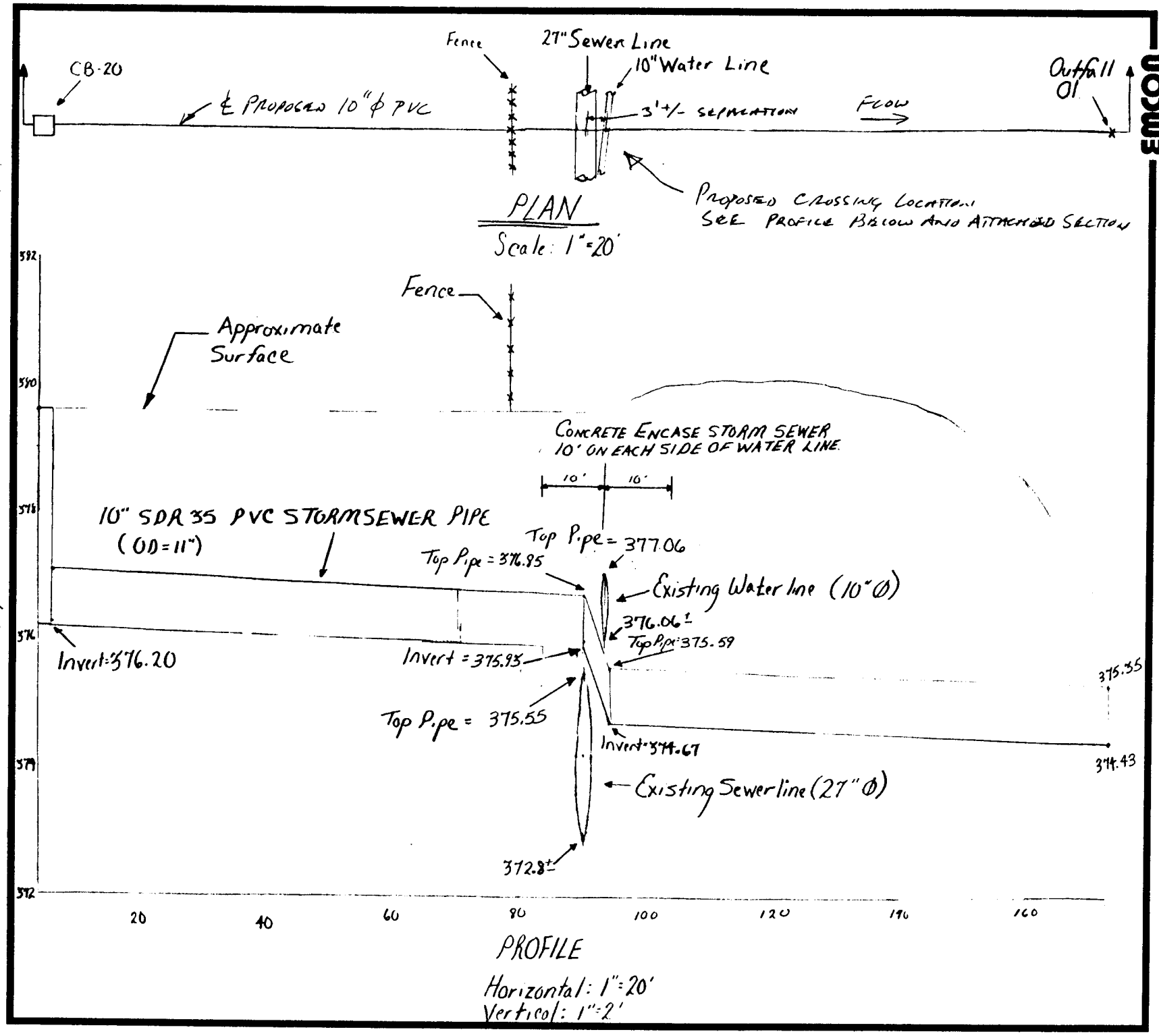
I:\DIV09\PROJECTS\0123623\2_CORRES\EMCOM.WPD:mcp:ss

cc: Mathew Reynolds, Jr., Superintendent - Town of DeWitt Water Department
Art Russell - Onondaga County Department of Drainage and Sanitation
Gary D. Cannerelli, P.E. - O'Brien & Gere Engineers, Inc.
Ralph Whedon - O'Brien & Gere Engineers, Inc.

COMPUTATION SHEET

PROJECT TITLE: Lockheed Martin Corporation PROJECT NO: 84193-004.004
DESCRIPTION: Storm Sewer Realignment Plan & Profile SHEET 1 OF 2
PREP. BY: CPL DATE: 9/11/97 CHKD BY: WAD DATE: 9/11/97

EMCON 09-JUL-93

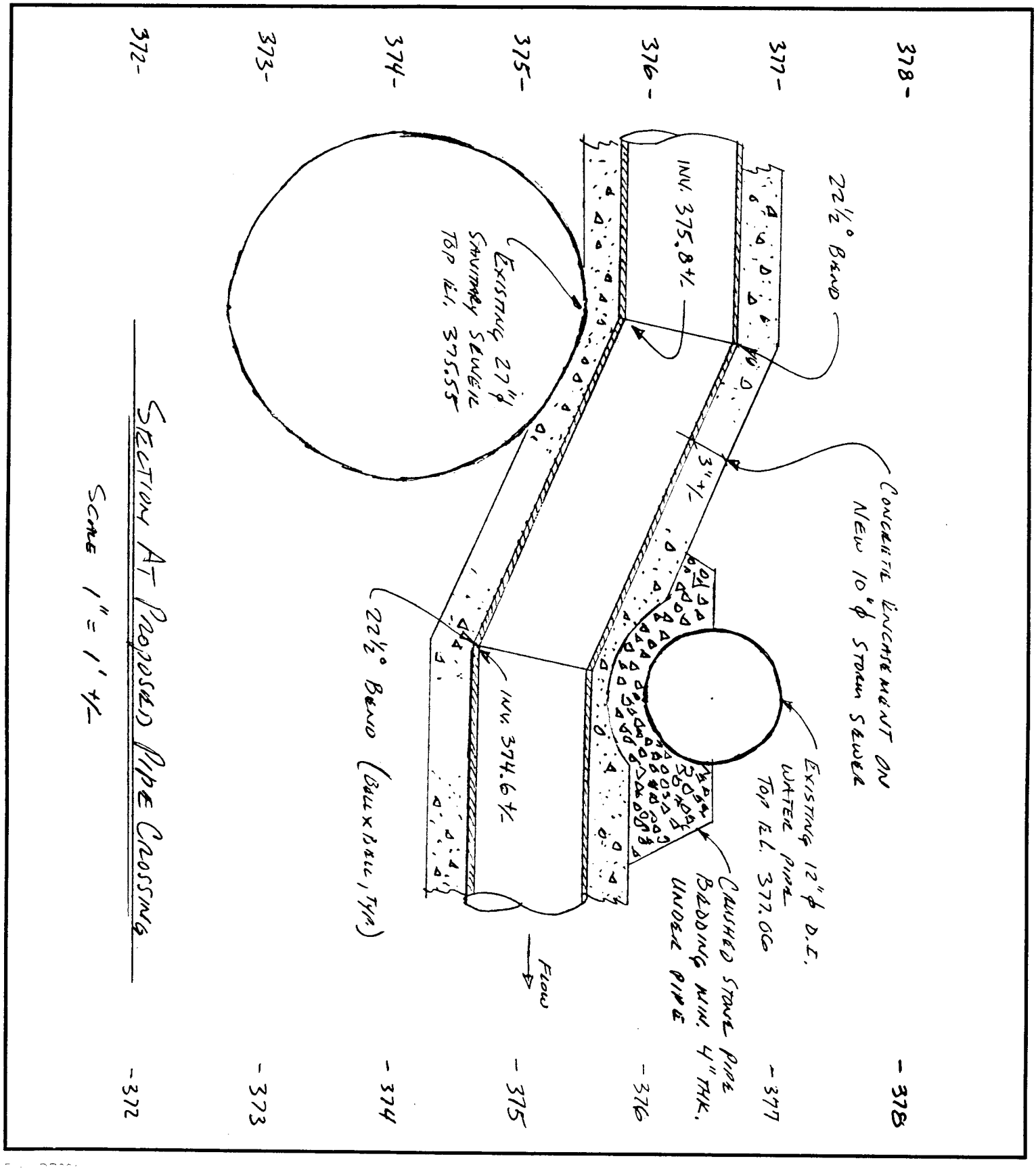


Form DR001

By CPG/LKS Date 8/11/97
Chkd. by WRD Date 8/14/97
Subject LOCKHEED MARTIN – STORM SEWER RE-ALIGNMENT SECTION

EMCON

Job No. 86143-004.000
Sheet No. 2 of 2



SECTION AT PROPOSED PIPE CROSSING

SCALE 1" = 1' ±

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

John P. Cahill
Commissioner

August 15, 1997

Patrick D. Salvador, P.E.
Principal Engineer
Lockheed Martin Corporation
P.O. Box 4840
Syracuse, New York 13221-4840

Re: Former GE Court Street 5/5A Plant (Site ID# 734070)

Dear Mr. Salvador:

The Department has reviewed Lockheed Martin's August 14, 1997 submission of plan, profile and cross-section sketches for a minor modification to the Storm Sewer IRM design. This modification is necessary due to the existence of a Town of Dewitt water line in the proposed path of the new storm sewer line. The modification is acceptable to the Department provided that Lockheed Martin obtains any necessary approvals from the Town of Dewitt and the Onondaga County Department of Health.

If you have any questions, feel free to contact me at (518) 457-1641.

Sincerely,

Alyse Peterson

Alyse Peterson
Environmental Engineer
Bureau of Central Remedial Action
Division of Environmental Remediation

cc: H. Hamel (NYSDOH)
A. Hess (USEPA)

Onondaga County Health Department

Division of Environmental Health

4994 Onondaga Road
P.O. Box 190
Syracuse, New York 13215-0190

Bureau of Public Health Engineering
(315) 435-6600

August 21, 1997

Sear-Brown Group
(Environmental Division)
85 Metro Park
Rochester, New York 14623-2674

Att. Kevin Ignaszak

Re: Lockheed Martin Court Street
Town of Dewitt

Dear Mr. Ignaszak:

Bob Hayes from our Plumbing Control Section asked me to review your August 12, 1997 submittal to Gary Cannerelli regarding the storm sewer crossing the existing 27" sanitary sewer and 12" water main.

The plan, as submitted, meets the requirements of Recommended Standards For Water Works and therefore is acceptable to this office.

Please contact this office should you have any questions.

Very truly yours,

Richard R. March, P.E.
PUBLIC HEALTH ENGINEERING

RRM/lr

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

John P. Cahill
Commissioner

November 3, 1997

LOCKHEED MARTIN
OR & SS

NOV - 6 1997

Environment Safety
& Health

Patrick D. Salvador, P.E.
Principal Engineer
Lockheed Martin Corporation
P.O. Box 4840
Syracuse, New York 13221-4840

Re: Former GE Court Street 5/5A Plant (Site ID# 734070)

Dear Mr. Salvador:

Enclosed, please find a copy of the laboratory analytical data for the storm sewer IRM confirmation split sampling performed at Outfall 2A on September 5, 1997.

If you have any questions, feel free to contact me at (518) 457-1641.

Sincerely,

Alyse Peterson
Environmental Engineer
Bureau of Central Remedial Action
Division of Environmental Remediation

Enclosure

cc: H. Hamel (NYSDOH)
A. Hess (USEPA)

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OF2A

Lab Name: H2M LABS INC. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: TAM0905

Matrix: (soil/water) WATER Lab Sample ID: 9725646

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: V2550.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/15/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	chloromethane	1	U
75-01-4	vinyl chloride	1	U
74-83-9	bromomethane	1	U
75-00-3	chloroethane	1	U
67-64-1	acetone	5	U
75-35-4	1,1-dichloroethene	0.6	J
75-15-0	Carbon Disulfide	1	U
75-09-2	methylene chloride	2	U
156-60-5	trans-1,2-dichloroethene	1	U
75-34-3	1,1-dichloroethane	9	
108-05-4	Vinyl Acetate	1	U
156-59-4	cis-1,2-dichloroethene	1	U
74-97-5	bromochloromethane	1	U
67-66-3	chloroform	1	U
78-93-3	2-butanone	5	U
71-55-6	1,1,1-trichloroethane	1	
56-23-5	carbon tetrachloride	1	U
71-43-2	benzene	1	U
107-06-2	1,2-dichloroethane	1	U
79-01-6	trichloroethene	1	U
78-87-5	1,2-dichloropropane	1	U
75-27-4	bromodichloromethane	1	U
10061-01-5	cis-1,3-dichloropropene	1	U
108-10-1	4-methyl-2-pentanone	5	U
108-88-3	toluene	1	U
10061-02-6	trans-1,3-dichloropropene	1	U
79-00-5	1,1,2-trichloroethane	1	U
127-18-4	tetrachloroethene	1	U
124-48-1	dibromochloromethane	1	U
591-78-6	2-hexanone	5	U
108-90-7	chlorobenzene	1	U
100-41-4	ethylbenzene	1	U
1330-20-27	xylene (total)	1	U
100-42-5	styrene	1	U
75-25-2	bromoform	1	U
79-34-5	1,1,2,2-tetrachloroethane	1	U
541-73-1	1,3-dichlorobenzene	1	U
106-46-7	1,4-dichlorobenzene	1	U
95-50-1	1,2-dichlorobenzene	1	U

9/14/97

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

OF2A

Lab Name: H2M LABS INC. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: TAM0905

Matrix: (soil/water) WATER Lab Sample ID: 9725646

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: V2550.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/15/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
96-12-8	1,2-dibromo-3-chloropropane	1	U
106-93-4	1,2-dibromoethane	1	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OF2A

Lab Name: H2M LABS INC. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: TAM0905

Matrix: (soil/water) WATER Lab Sample ID: 9725646

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: V2550.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/15/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NO.	COMPOUND	RT	EST. CONC.	Q

S 0017

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIPBLANK

Lab Name: H2M LABS INC. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: TAM0905

Matrix: (soil/water) WATER Lab Sample ID: 9725647

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: V2553.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/15/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	chloromethane	1	U
75-01-4	vinyl chloride	1	U
74-83-9	bromomethane	1	U
75-00-3	chloroethane	1	U
67-64-1	acetone	0.9	J
75-35-4	1,1-dichloroethene	1	U
75-15-0	Carbon Disulfide	1	U
75-09-2	methylene chloride	0.9	J
156-60-5	trans-1,2-dichloroethene	1	U
75-34-3	1,1-dichloroethane	1	U
108-05-4	Vinyl Acetate	1	U
156-59-4	cis-1,2-dichloroethene	1	U
74-97-5	bromochloromethane	1	U
67-66-3	chloroform	1	U
78-93-3	2-butanone	5	U
71-55-6	1,1,1-trichloroethane	1	U
56-23-5	carbon tetrachloride	1	U
71-43-2	benzene	1	U
107-06-2	1,2-dichloroethane	1	U
79-01-6	trichloroethene	1	U
78-87-5	1,2-dichloropropane	1	U
75-27-4	bromodichloromethane	1	U
10061-01-5	cis-1,3-dichloropropene	1	U
108-10-1	4-methyl-2-pentanone	5	U
108-88-3	toluene	1	U
10061-02-6	trans-1,3-dichloropropene	1	U
79-00-5	1,1,2-trichloroethane	1	U
127-18-4	tetrachloroethene	1	U
124-48-1	dibromochloromethane	1	U
591-78-6	2-hexanone	5	U
108-90-7	chlorobenzene	1	U
100-41-4	ethylbenzene	1	U
1330-20-27	xylene (total)	1	U
100-42-5	styrene	1	U
75-25-2	bromoform	1	U
79-34-5	1,1,2,2-tetrachloroethane	1	U
541-73-1	1,3-dichlorobenzene	1	U
106-46-7	1,4-dichlorobenzene	1	U
95-50-1	1,2-dichlorobenzene	1	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIPBLANK

Lab Name: H2M LABS INC. Contract:

Lab Code: Case No.: SAS No.: SDG No.: TAM0905

Matrix: (soil/water) WATER Lab Sample ID: 9725647

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: V2553.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. Date Analyzed: 09/15/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
96-12-8	1,2-dibromo-3-chloropropane	1	U
106-93-4	1,2-dibromoethane	1	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIPBLANK

Lab Name: H2M LABS INC. Contract: _____

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: TAM0905

Matrix: (soil/water) WATER Lab Sample ID: 972564?

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: V2553.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/15/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NO.	COMPOUND	RT	EST. CONC.	Q

APPENDIX B

SHOP DRAWINGS AND TECHNICAL DATA

MIRAFI® SILT FENCE

Prefabricated Silt Fence Structures for Sedimentation Control

PRODUCT DESCRIPTION

Mirafi Silt Fence structures, composed of specially developed fabrics on supporting posts, are designed for efficient control of sediment run-off from construction sites. This sediment, left unchecked, can clog and pollute native waterways and damage natural areas. Controlling the run-off (an increasing environmental concern) is advantageous to owners, contractors and engineers who face the economic costs associated with site sediment loss. Installed correctly in the field, the sedimentation control fabric in silt fence structures functions as a filter and a run-off flow velocity check. Fine-grained sediment is trapped by the fabric while storm water run-off may pass through the fabric at a moderate rate.

FEATURES

Mirafi Prefabricated Silt Fence with Posts

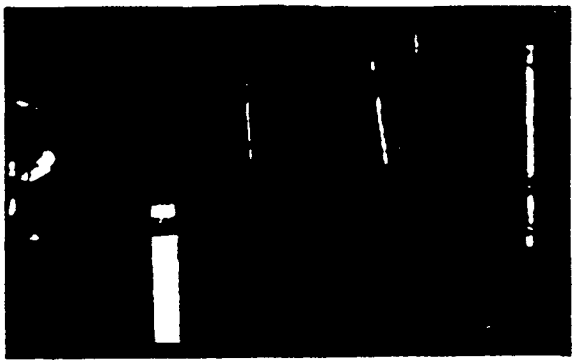
The prefabricated silt fence with posts is pre-assembled, and is ready for immediate installation upon delivery to your site. The prefabricated system has a number of unique features and advantages:

- Complete prefabricated system
- 3.8 cm (1-1/2") nominal square hardwood posts
- Available in a variety of fabric types to meet specifications for adherence to governmental agencies' regulations
- Available in varying fabric widths
- Standard reinforced top edge with high-strength industrial tensioning belt for added reinforcement
- Available in a selection of post heights and post spacings

Mirafi Envirofence

Envirofence is a pre-assembled silt fence which features a net backing for support. The prefabricated system offers the following features:

- Complete prefabricated system
- Additional support provided by net backing
- 3.8 cm (1-1/2") nominal square hardwood posts
- Tensioning belt



Silt Fence with Posts

Mirafi Envirofence

Mirafi Silt Fence Fabric

Mirafi also provides you with an assortment of UV protected, nonfabricated sedimentation control fabrics in a choice of widths and lengths. Each fabric is designed to meet the specifications and regulations for sedimentation control required by local governmental agencies.

Optional pockets are available for posts on Mirafi Silt Fence.

EMCON
WORKING DRAWING REVIEW
☑ APPROVED
☐ APPROVED AS NOTED
NICOLON MIRAFI GROUP
PROJECT 961[illegible].000
DATE SUBMITTED 7/24/97
DATE REVIEWED
CHECKED BY CPL
Approval is only for general compliance with design concept. The Contractor is responsible for errors, omissions and deviations in plans and specifications. Dimensions must be verified by Contractor on the working drawings.

SEDIMENTATION CONTROL

Mirafi® Silt Fence Technical Data

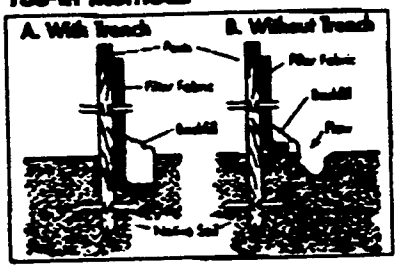
PROPERTY	TEST METHOD	UNIT	MINIMUM AVERAGE ROLL VALUES
Grab Tensile Strength (machine direction)	ASTM D 4632	kN (lbs)	0.53 (120)
Grab Tensile Strength (cross-machine direction)	ASTM D 4632	kN (lbs)	0.45 (100)
Grab Tensile Elongation	ASTM D 4632	%	10
Mullen Burst Strength	ASTM D 3786	kPa (psi)	2067 (300)
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.27 (60)
Permittivity	ASTM D 4491	sec	0.2
Water Flow Rate	ASTM D 4491	l/min/m² (gal/min/ft²)	817 (20)
Ultraviolet Stability	ASTM D 4355	%	70

Mirafi® Silt Fence Packaging

SILT FENCE TYPE	[redacted]	FABRIC WIDTH	POST LENGTH	POST OR POCKET SPACING	SHIPPING WEIGHTS
Prefab with Posts	30.5 m (100')	6 m (2')	.91 m (36")	2.5 m (8.3')	18 kg (40 lbs)
	30.5 m (100')	.9 m (3')	1.22 m (48")	2.5 m (8.3')	23 kg (50 lbs)
Envirofence	30.5 m (100')	.9 m (3')	1.22 m (48")	2.35 m (7.7')	25 kg (55 lbs)
Fabric Only	100.6 m (330')	.9 m (3')	—	—	12 kg (26 lbs)
	274.3 m (900')	.9 m (3')	—	—	32 kg (70 lbs)
Master Rolls	varies	.9 m (3')	—	—	varies

Mirafi® Silt Fence Installation Guidelines

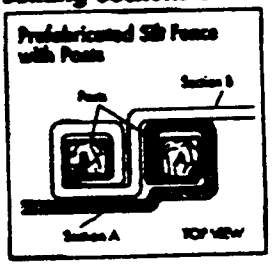
Toe-In Methods



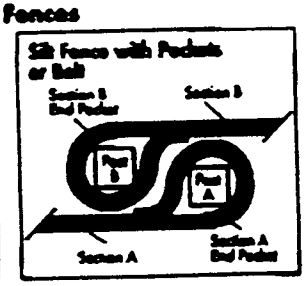
A. With Trench
- Excavate a 15.2 cm x 15.2 cm (6" x 6") trench along lower perimeter of site.
- Unroll silt fence one section at a time. Posts should be positioned on downstream side of fence.
- Drive post into ground and lay the toe-in fabric flap in bottom of trench. Backfill trench, and tamp ground as shown in diagram above.

B. Without Trench
- Toe-in can also be accomplished by laying the fabric flap on untrenched ground and piling and tamping soil over the flap at the base of the structure.

Joining Sections of Silt Fences

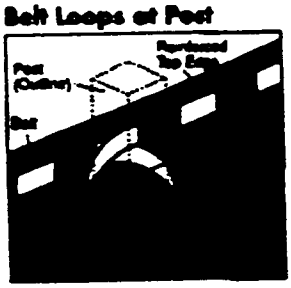


- Position posts to overlap as shown above, making certain that fabric folds around each post one full turn.
- Drive posts tightly together and secure tops of posts by tying off with cord or wire to prevent flow-through of built-up sediment at joint.



- Overlap posts as shown in previous section to prevent flow-through.
- Drive posts firmly together and tie off tops of posts to prevent separation.

Belt Loops at Post



- Belt should be secured at roll end to prevent rollout.
- Joining of sections should be accomplished in basically the same manner as the fence with pockets. Do not use belt to secure adjoining tops of posts. Use rope or wire as in previous type fences.
- To simply secure posts to belted fabric at a given point along length of fabric, pull belt out from reinforced top, twist to form a loop, and slip post up through loop before driving post into place.

EMCON
WORKING DRAWING REVIEW
☑ APPROVED ☐ REVISE & RESUMIT
☐ APPROVED AS NOTED ☐ NOT APPROVED
DATE SUBMITTED 7/24/97
DATE REVIEWED
CHECKED BY CPL
Approval is only for general compliance with the design concept of the project. Contractor is responsible for [illegible] plans and specifications. Contractor on the working drawings.

DISCLAIMER

The information presented herein will not apply to every installation. Applicability of products will vary as a result of site conditions and installation procedures. Final determination of the suitability of any information or material for the use contemplated, of its manner of use, and whether the use infringes any patents, is the sole responsibility of the user.

Mirafi® is a registered trademark of Nicolon Corporation.

NICOLON MIRAFI GROUP
3500 Parkway Lane, Suite 500
Norcross, Georgia 30092
(800) 234-0484, (770) 447-6272, Fax (770) 729-1206

PDS-SF-498

Tamms

TECHNICAL DATA SHEET

HORN

HORN NON-CORROSIVE NON-SHRINK GROUT

Cementitious Industrial Grout

03600

GROUT
CONCRETE

1. **DESCRIPTION:** HORN NON-CORROSIVE NON-SHRINK GROUT is a nonshrink, nonstaining, ready-to-use, high early strength grout. Its multi flow quality allows this product to be used at various consistencies including pumping into inaccessible areas. HORN NON-CORROSIVE NON-SHRINK GROUT may be packed, rodded, vibrated, poured or pumped. It has high compressive and flexural strengths and is non rusting and non corrosive.

2. **USES:** HORN NON-CORROSIVE NON SHRINK GROUT is used interior or exterior to grout machinery base plates, structural steel, columns, post tensioned cables, anchor bolts, precast structural members, tee joints and a wide range of concrete repair applications. Advantages include:
   - –high fluidity, with extended working time for easier placement
   - –can be used in wet areas - will not rust
   - –controlled expansion without confinement - does not shrink or overexpand
   - –high early and ultimate strengths
   - –usable in any environment - interior or exterior, wet or dry, hot or cold, above or below grade
   - –sets rapidly and uniformly
   - –versatile flow capability - pumped, poured or dry packed

MATERIAL PROPERTIES

Material Properties @ 75°F (25°C)	Plastic	Pourable	Flowable
Mix water per 50 lb bag, pints	5-3/4	6-1/2	7-1/2
Flow ASTM C230 (flow table)	100%	125%	-
CRD C611 (flow cone)	-	-	30 secs
Setting Time, ASTM C191, hours			
Initial	1.0-1.5	2.0-3.0	4.0-4.5
Final	2.5-3.5	3.5-4.5	6.0-8.0
Compressive Strength, ASTM C109, psi			
1 day	4,000	3,800	2,800
3 day	5,500	5,000	4,700
7 day	7,500	7,000	6,500
28 day	8,000	7,800	7,500
Modulus of Elasticity, ASTM C469 - 4.31 x 10⁶ psi			
Tensile Strength, ASTM C190 psi			
1 day	550		
28 day	640		
Expansion, CRD C588, pct.			
1 day	+0.030%	+0.025%	+0.017%
3 day	+0.040	+0.030	+0.020
28 day	+0.040	+0.030	+0.020
Flexural Strength, ASTM C348, psi			
7 day	1,150		
28 day	1,430		
Early age Height change % ASTM C827	1.68	1.49	1.42
Height change of grout expansion % CRD 621			
3 day	0.06	0.08	0.09
28 day	0.08	0.08	0.10

Values presented are typical and not necessarily referenced to exact specifications.

3. **COMPOSITION AND MATERIAL:** HORN NON-CORROSIVE NON-SHRINK GROUT is a proprietary formulation of cements and graded aggregates.

4. **COMPLIANCE:** HORN NON-CORROSIVE NON-SHRINK GROUT complies with the following specifications:
   - –Corp of Engineer Specifications CRD C-621 and CRD C588
   - –ASTM standards: ASTM C-827 and ASTM C1107

   Compressive strength is the most often quoted property of cementitious mixtures. Normal 28 day compressive strength of portland cement concrete is 3,000 psi

   Controlled expansion measures the grout's ability to attain and maintain positive and complete contact with base plates, rebars, bolts, etc. Fluidity and Flowability describes the grout's ability to flow freely into a cavity. Pull out test are conducted to establish anchoring strength. There are no standard tests for this. HORN NON-CORROSIVE NON-SHRINK GROUT was tested by drilling 2" diameter holes in fully cured concrete with a compressive strength of 7,520 psi. Pull out test made at 7, 14 and 28 days on NO. 9 grade 60 bars embedded in the holes at depths of 12, 15, and 18 inches showed that the ultimate failure load exceeded the 60,000 psi specified minimum yield point of the rebars.

5. **SURFACE PREPARATION:** Concrete surface must be structurally sound, dry, free of grease, oils, coatings, dust, curing compounds and other contaminants. Edges of concrete to be grouted that are less than 1 inch (2.54 cm) thick must be vertically cut to form a uniform butt. Smooth substrates must be abraded to ensure proper bonding. Shim and anchor support elements, to prevent movement. Steel must be free of oils, greases, dirt, old coatings or chemical contaminants. Saturate the prepared area with potable water for 12 to 24 hours before application. Remove excess water from holes and voids just before placement to prevent dilution of the grout.

6. **MIXING INSTRUCTIONS:** HORN NON-CORROSIVE NON-SHRINK GROUT is factory-proportioned and comes ready to use by adding only potable water. Use 5-3/4 pints of water per bag of grout for a plastic mix: 6-1/2 pints for a pourable mix and 7-1/2 pints for a high flow mix. For a uniform mix, use a paddle type mortar mixer. Add 2/3 of the water for the mix consistency desired into the mixer. Add the grout and mix partially. Add the remaining water to achieve the final consistency. Thoroughly mix the entire quantity for 2-3 minutes. Do not mix more material than can be placed in 30 minutes. Do not retemper with additional water

TAMMS INDUSTRIES
APRIL 1995 (Replaces 11/94)

Tamms
GROUT
CONCRETE
03600

after the mixture has started to set. Do not aerate the mix.

7 **APPLICATION TECHNIQUES:** All grouting should be done using established procedures and recommendations of ACI for placing and curing concrete. The method of forming must provide for rapid continuous pouring of the grout and allow a clearance of at least 3 inches for entry and a "grout head" of 4 to 6 inches. Avoid air entrapment by providing adequate venting at the high point and by pouring the grout from one side only. Forms should be 1 to 2 inches above the base plate. HORN NON-CORROSIVE NON-SHRINK GROUT must be placed by pumping, pouring, rodding or vibrating. Lengths of small link chain laid in the form before placing the grout will assist in compacting the grout and eliminating air voids. The grout must be placed and compacted within 30 minutes after mixing. In applications where grout thickness extends from 2 inches up to 5 inches, approximately 12 pounds of 3/8 inch pea gravel which is washed and surface saturated dry may be added per 50 pound bag to extend the mix. For thicknesses over 5 inches, up to 25 pounds of pea gravel may be added per 50 pound bag of HORN NON-CORROSIVE NON-SHRINK GROUT. After placement, rapid drying must be prevented by covering the grout with wet burlap or by applying a membrane forming curing compound from the CLEARSEAL series of products. The forms may be removed after the grout has hardened to an initial set (see material properties). When grouting at higher temperatures, use cool water, shade the area to be grouted and protect the placed grout from direct sunlight for at least 48 hours by covering with wet burlap. When grouting at low temperatures, raise the temperature of foundation bedplate by using steam or infrared heaters. Use warm mixing water and cover the grout to retain warmth. Do not apply heat directly to the grout after its placement. Chloride based set accelerators are not recommended.

8. **COVERAGE:** One 50 pound (22.7 kg) bag will yield approximately 0.43 cubic foot (0.012 cu.m) of grout.

9. **CLEAN-UP INSTRUCTIONS:** Clean tools and equipment with water immediately following. Clean drips with water while still wet. Dried HORN NON-CORROSIVE NON-SHRINK GROUT will require mechanical abrasion for removal.

10. **CAUTIONS:** Admixtures or fluidifiers are not recommended. Proper curing practices must be observed.

11. **ENVIRONMENTAL AND SAFETY PRECAUTIONS:** Contains portland cement which is alkaline on contact with water. Do not breathe dust. May cause delayed lung injury (Silicosis). IARC reports Crystalline silica may cause cancer in humans. Irritating to eyes and skin. Avoid splashing into eyes or contact with skin. In case of eye contact, flood eyes repeatedly with potable water and call a physician. DO NOT RUB EYES. Wash skin thoroughly after handling and before smoking or eating. Use adequate ventilation.

12. **PACKAGING & STORAGE:** 50 lb. (22.7 kg) poly-lined and DOT approved bags. Protect from moisture. The shelf life is 1 year in unopened bags and in protected storage. The freight class 55.

13. **TECHNICAL SERVICE:** For application procedures or surface conditions not specified above, please contact:

TAMMS INDUSTRIES
7405 Production Drive Mentor, OH 44060
800-21-TAMMS FAX: 216-974-2388

WARRANTIES: Seller warrants that the Products do not infringe upon any copyright, patent, or trademark or trade secret, nor violate the proprietary information rights of any third party. Seller warrants that its Products will conform to and perform in accordance with the Products' specifications. THE FOREGOING WARRANTIES, ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THOSE CONCERNING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. LIMITATION ON LIABILITIES: Because of the difficulty of ascertaining and measuring damages hereunder, it is agreed that, except for claims for bodily injury, Seller's liability to the Buyer or any third party, for any losses or damages, whether direct or otherwise, arising out of the purchase of Product from Seller by Buyer shall not exceed the total amount billed and billable to the Buyer for the Product hereunder. **IN NO EVENT WILL SELLER BE LIABLE FOR ANY LOSS OF PROFITS OR OTHER SPECIAL OR CONSEQUENTIAL DAMAGES, EVEN IF SELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.**

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NORTH AMERICA, INC., Mentor, OH 44060

H-106D1990 Tamms Industries 4/95 • 5

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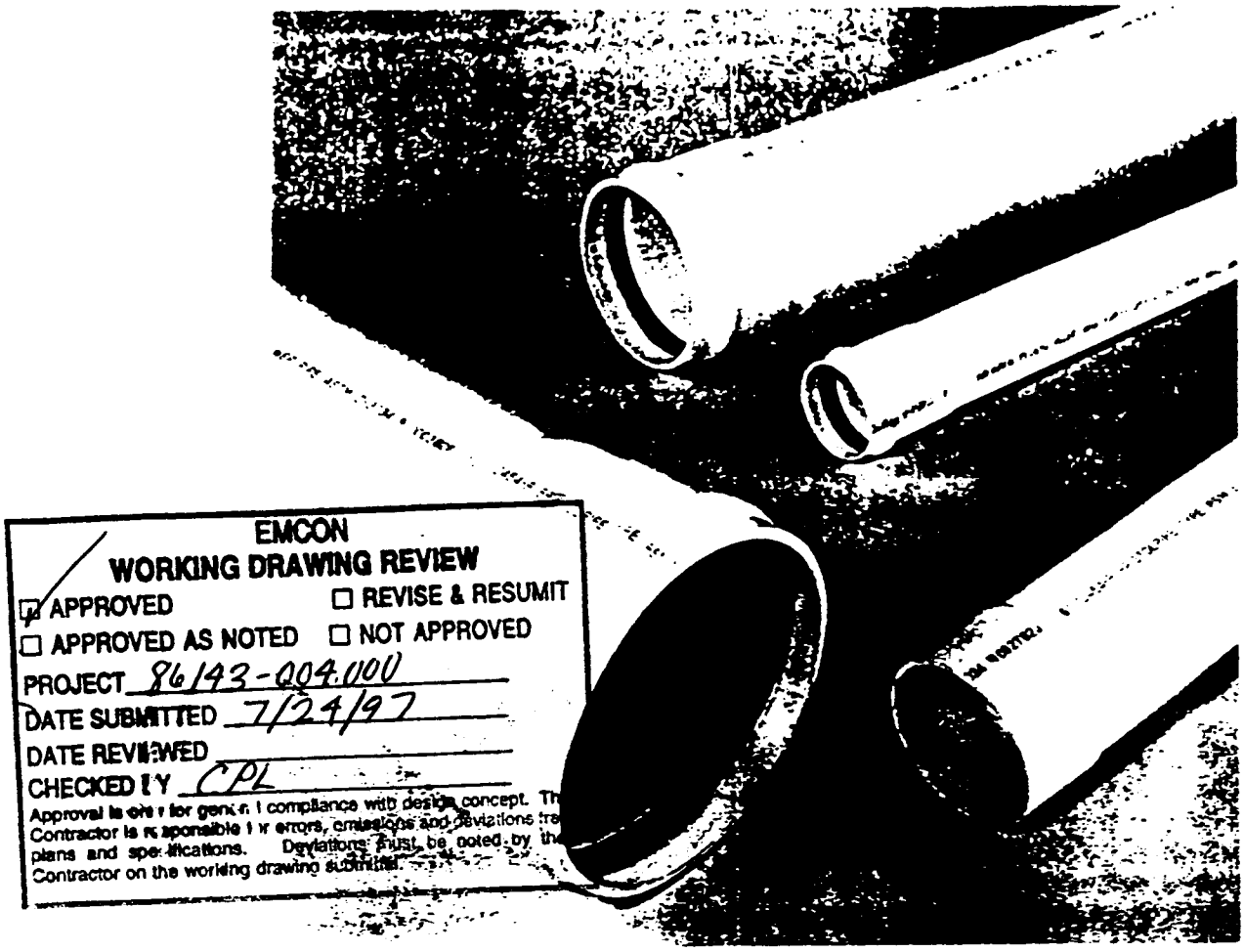
Bristolpipe

PVC SEWER MAIN PIPE

with locked-in gasket or solvent weld bell



for gravity sewer systems

ASTM D-3034 — SDR 35

BRISTOLPIPE™ PVC SEWER PIPE FEATURES

- Resistance to corrosion and abrasion
- Resistance to chemicals normally found in sanitary sewer systems
- Smooth bore for improved flow characteristics
- High impact strength
- Low cost installation
- Lightweight

LOCKED-IN GASKET

- Eliminates the possibility of fish-mouthing
- Minimizes common causes of leakage
- Eliminates lost gaskets
- Improves installation efficiency
- Provides flexibility under earth movement

PRODUCT SPECIFICATIONS

SDR 35 PVC INTEGRAL GASKET SEWER PIPE

Nominal Size	Item Number	*Feet Per Length	Feet Per Pallet	Outside Diameter	Wall Thickness	Pounds Per Foot
4"	PG134-13	13	780	4.215	.120	1.055
6"	PG234-13	13	338	6.275	.180	2.350
8"	PG334-13	13	195	8.400	.240	4.200
10"	PG434-13	13	104	10.500	.300	6.570
12"	PG534-13	13	104	12.400	.360	9.400
15"	PG634-13	13	78	15.300	.437	14.500

*Gasket sewer pipe sold as 13' lay length.

Specifications and Certifications

ASTM D-3034 SDR-35 Specifications for PVC Integral Gasket Sewer Pipe.
D-3212 and F477 Specifications for Flexible Elastomeric Seals.

CELL CLASS 12454-B

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ASSEMBLY INFORMATION

Integral Gasket System:

1. Cut to desired length with pipe cutters, hack saw, or cross cut saw.
2. Ream pipe internally to remove burrs and ragged edges.
3. Bevel the spigot end with a file or wood rasp.
4. Be sure all joining surfaces are free of dirt, dust, water, and oil.
5. Carefully clean gasket.
6. Apply lubricant to surface of spigot end up to the socket depth.
7. Insert spigot into bell end with a quick push.

Solvent Weld:

1. Use a good grade of PVC cement which meets ASTM standard D-2564.
2. Cut pipe to desired length with pipe cutters, hack saw, or cross cut saw.
3. Ream pipe both internally and externally to remove burrs and ragged edges.
4. Before making solvent weld joint be sure all joining surfaces are free of dirt, dust, water, and oil.
5. The use of a primer before the application of PVC cement is recommended.
6. Apply primer to both joining surfaces.
7. Immediately apply a smooth coat of cement to the joining surfaces.
8. Immediately insert the spigot end into the bell end to the full depth of the socket.
9. Turn pipe ¼ to ½ turn in the socket to insure an even spread of cement.
10. Hold firmly in position for 15 seconds.
11. Allow joint to set according to cement manufacturers instructions.

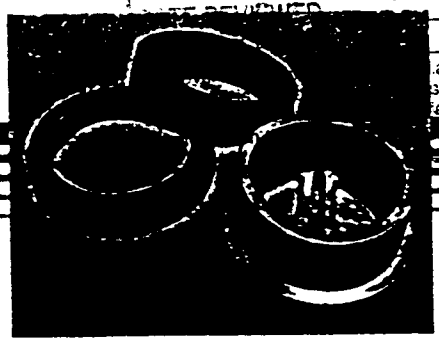
Dura-Tech, a leading producer of cost and labor saving products for the construction trade, has developed the latest technology in pipe-to-manhole connectors that will increase profits and productivity for the precaster and contractor.

The **Dura-Seal III**[T.M.] system can easily be adapted to your present operation without additional equipment expense.

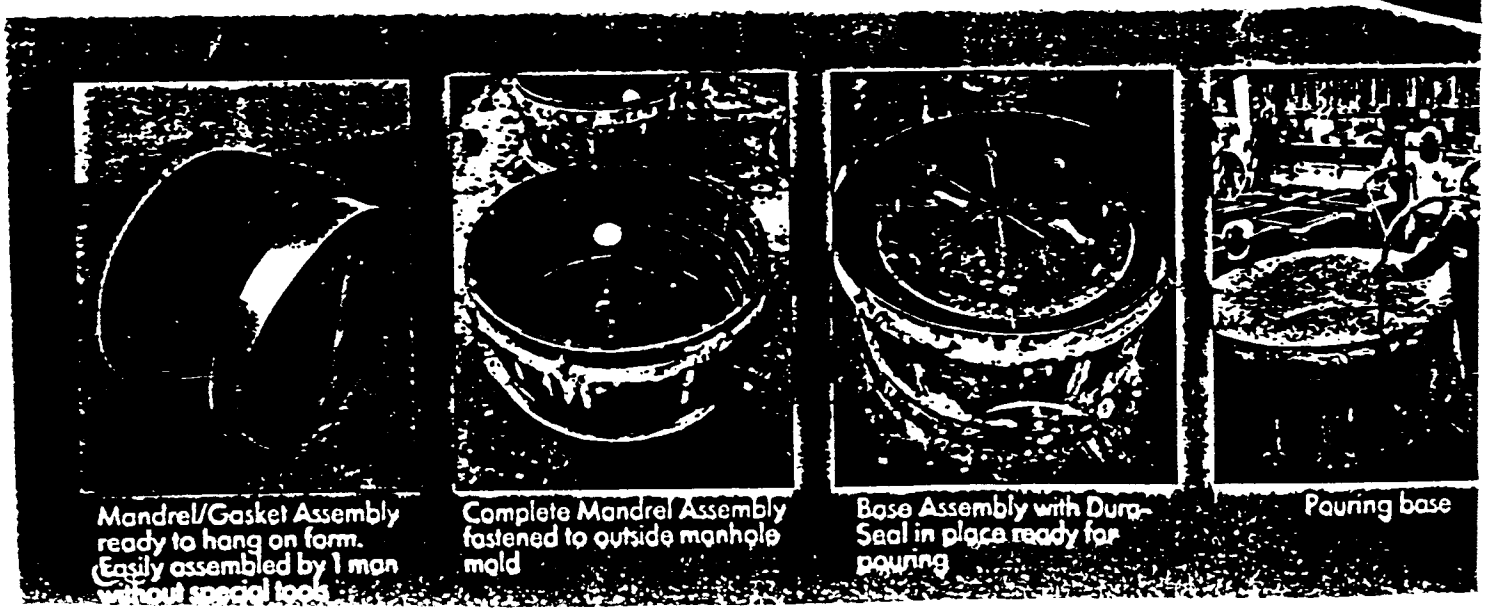
Dura-Seal III was designed and manufactured by Dura-Tech to be the most dependable, time saving seal on the market. Our patented, multifinned, flexible gasket becomes an integral part of the manhole base which produces a positive, watertight custom fit where the pipe makes contact and can not slip, twist, or dislodge.

Where a flat spot or severely out-of-round pipe does permit leakage, Dura-Tech's simple, 4-step injection sealant allows a quick repair by one workman inside the manhole, with no disruption to outside activities.

DURA-



Mandrel, Gaskets & Spacers – Stock sizes from 4" to 24" I.D. or custom sizes to fit any type pipe



Mandrel/Gasket Assembly ready to hang on form. Easily assembled by 1 man without special tools

Complete Mandrel Assembly fastened to outside manhole mold

Base Assembly with Dura-Seal in place ready for pouring

Pouring base

CONCRETE SEALANTS
8917 S. Palmer Road, Box 176
New Carlisle, Ohio 45344
Phone (513) 845-8776
FAX (513) 845-3587
BOND OF TRUST

Technical Product Bulletin

Damp-Proofing Concrete with ConSeal™ CS-55

Water Based Concrete Coating

Product Description

ConSeal CS-55 is an extremely fast-drying, water and polymer-based concrete coating for use on all types of concrete structures

Manufactured with non-toxic, environmentally friendly ingredients, CS-55 features an extremely low VOC content, may be applied with a brush, roller or sprayer and cleans up quickly with plain soap and water!

Product Features

- **Environmentally Friendly Water and Polymer-Based Formula**
  - Creates a hard, smooth polymer film that protects the structure from water intrusion and chemical attack.
  - Extremely low VOC (Volatile Organic Compound) content.
- **Extremely Fast Drying**
  - Dries in 5-10 minutes at 72°F and 15-20 minutes at 40°F. (Many asphalt based coatings require 48-72 hours.)
  - Fast drying time helps minimize mess on job site.
  - Allows coating and transporting structure almost immediately — or coating and drying on-site, if preferred.
- **Spray, Brush or Roll On for Three Times the Coverage of Asphalt-Based Products**
  - May be applied with choice of brush, paint roller or sprayer.
  - One gallon of CS-55 covers 300-350 square feet of wet cast concrete. (Asphalt-based coatings typically cover only 75-125 square feet per gallon.)
- **May Be Applied Across A Broad Range of Temperatures**
  - 40°F to 120°F
  - 4°C to 48°C
- **Cleans Up Quickly with Soap and Water**
  - Washes easily off skin.
  - No dangerous solvents required.

Product Applications

Designed as a damp-proof coating on ...

- Manholes
- Septic Tanks
- Utility Vaults
- Concrete Pipe
- Burial Vaults
- Similar Structures

Toll-Free Technical Assistance

Call Concrete Sealants for...
...Fast answers to your questions about any ConSeal product
...Help choosing the right product and size for your application
...Assistance with estimating how much product you'll need
...The industry's best technical support program, featuring TOLL-FREE access to the answers you need to solve your concrete sealing problems

1-800-332-SEAL
(1-800-332-7325)

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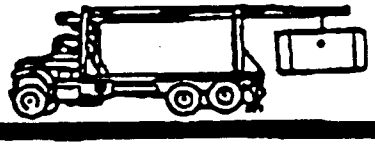


Peter Kilts
R.D. 2 Lakeport Road
Chittenango, New York 13037
Phone: 687-3093

MIX DESIGN FOR ALL PRECAST PRODUCTS

CONCRETE MINIMUM STRENGTH **** 4000 P.S.I. @ 28 DAYS

CEMENT **** 630 lbs. TYPE 1 7.0 BAG MIX ESROC MATERIALS

FINE AGGREGATE **** 1400 lbs. WASHED SAND MANICKER BROS.

COARSE AGGREGATE **** 1800 lbs. #1 STONE T. H. KINSELLA

ADMIXTURE **** 6 oz. AIR ENTRAINMENT 5% to 7% EUCO AIR

REINFORCEMENT **** 1.6 lbs. POLYPROPYLENE FIBERS FIBERMESH

WATER **** 25 to 30 gal. PER CUBIC YARD O.C.W.A.

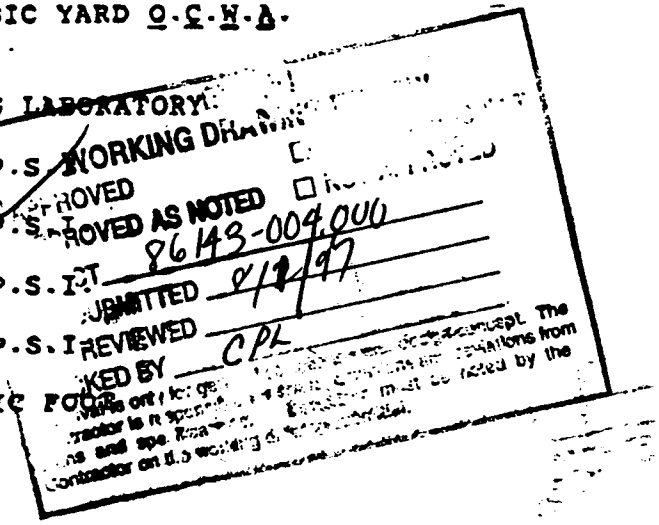
TEST RESULTS: PITTSBURGH TESTING LABORATORY

SAMPLE 1	7 DAYS	3890 P.S.I.
SAMPLE 2	7 DAYS	4050 P.S.I.
SAMPLE 3	28 DAYS	4950 P.S.I.
SAMPLE 4	28 DAYS	5010 P.S.I.

UNIT WEIGHT 144.90 lbs. PER CUBIC FOOT

ENTR. AIR 5.6%

ACTUAL SLUMP 5 in.



SPECIFICATION FOR MANHOLES CATCH BASIN AND H-20 TANKS

REINFORCEMENT ** GRADE 60 #4 BAR 0.12 SQ. IN./LIN. FT.

LOADING ** AASHTO HS 20-44 MEETS ASTM C-478 & C-857-87

JOINT ** 1" BUTYL RUBBER MORTAR INSIDE & OUT BY OTHERS

PIPE CONNECTION ** DURA-SEAL 111 SIZE REQUIRED

THE SEAR-BROWN GROUP

Project: LMC COURT ST. Project No. 14616

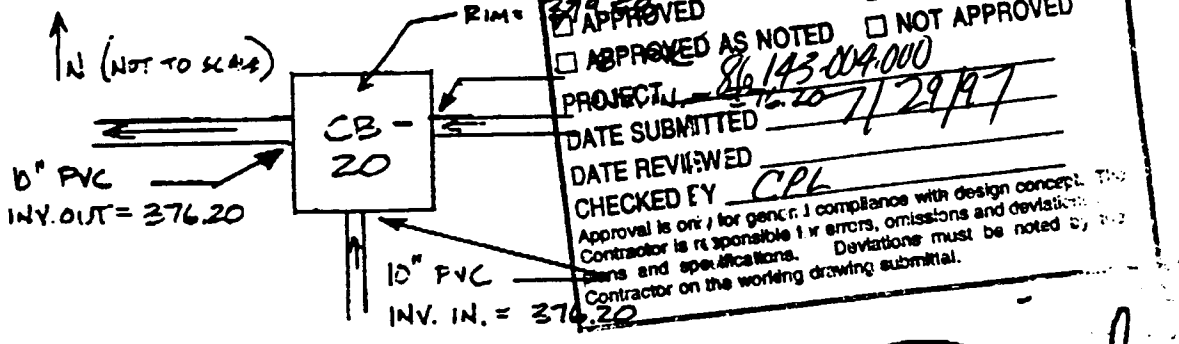
By: K. TGNASZAK Checked: _____

Date: 7/29/97 Sheet 1 of 1

CALCULATIONS FOR CATCH BASIN INVERT DESIGN

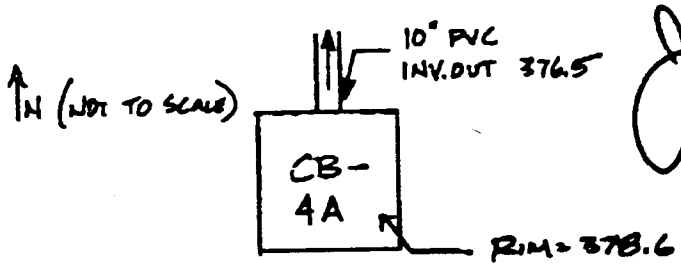
PROPOSED CATCH BASIN CB-20

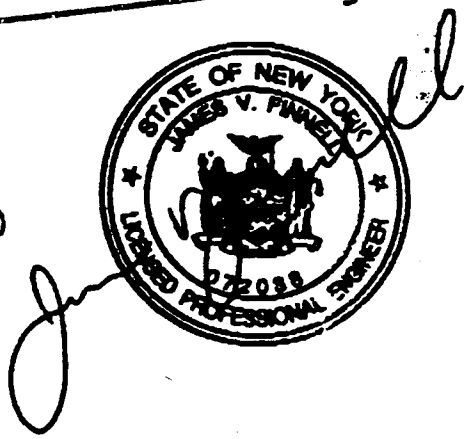
PER EMCON FAX (7/29/97)



PROPOSED CATCH BASIN CB-4A

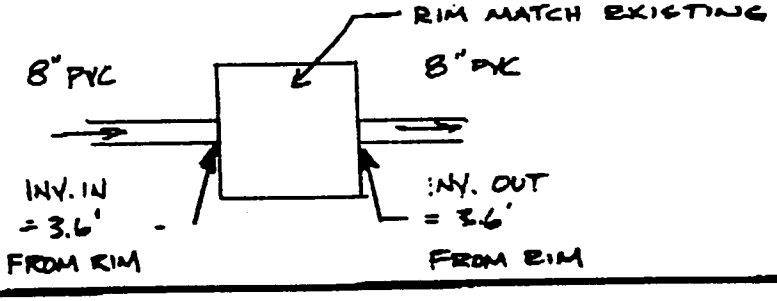
PER EMCON FAX (7/29/97)



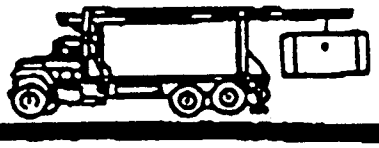


PROPOSED CATCH BASIN CB-5

PER SEAR-BROWN SURVEY (7/24/97



P & S Concrete Products

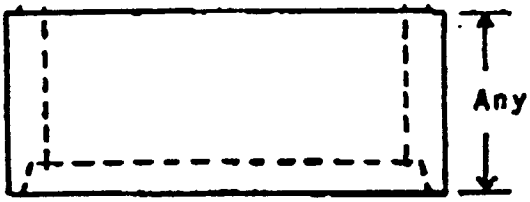


24" X 24" UTILITY VAULT

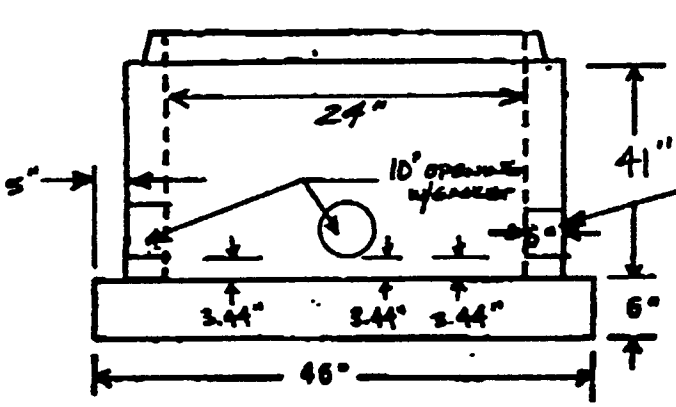
CB-20

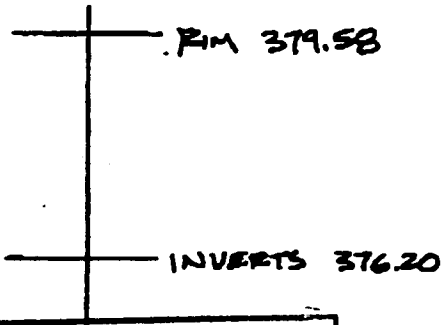
Peter Kilts
R.D. 2 Lakeport Road
Chittenango, New York 13037
Phone: 687-3093

S/C 2815 Frame & Grate
Installed By Others



Any Size Oppitional Riser (NOT REQUIRED)





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P & S Concrete Products

24" X 24" UTILITY VAULT

CB-4A

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S/C 2815 Frame & Grate
Installed By Others

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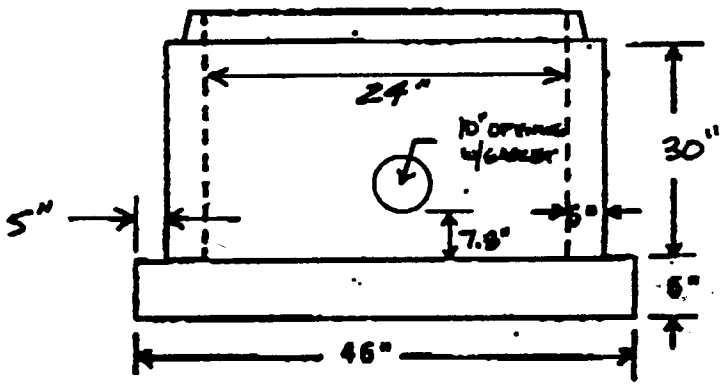

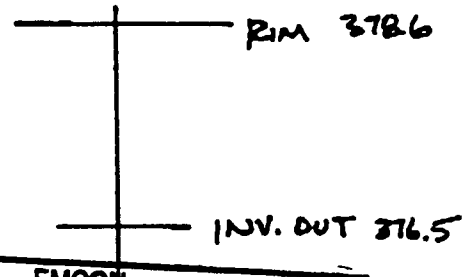

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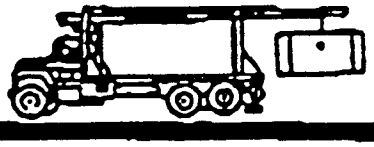

24" X 24" UTILITY VAULT

CB-S

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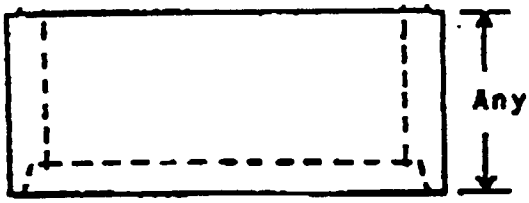
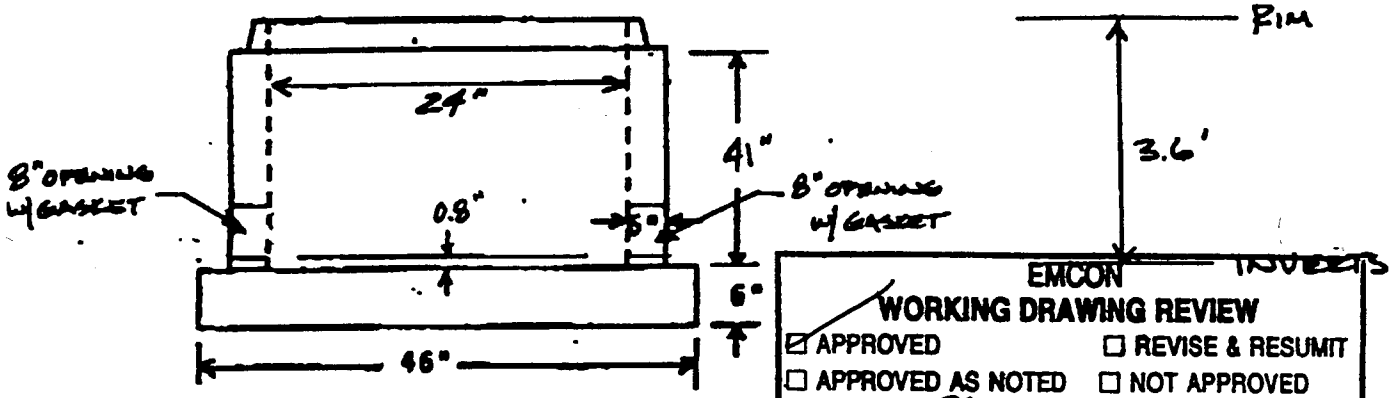
R.D. 2 Lakeport Road
Chittenango, New York 13037
Phone: 687-3093

S/C 2815 Frame & Grate
Installed By Others



Any Size Oppitional Riser (NOT REQUIRED)



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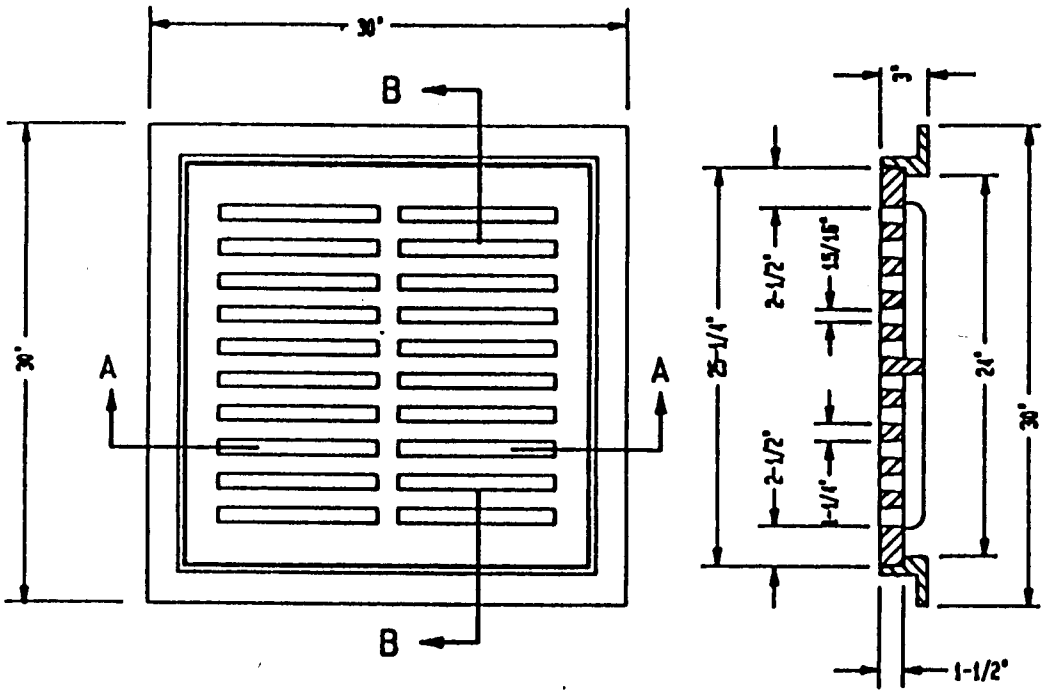

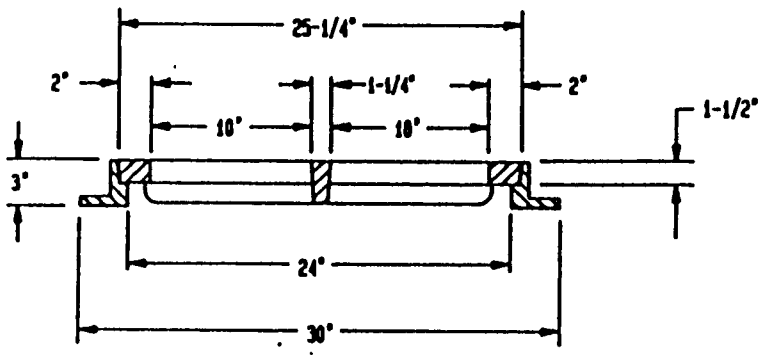

SECTION A - A

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SECTION R

NOTES:

1.) MATERIAL SHALL BE GRAY CAST IRON CONFORMING TO A.S.T.M. A48-83 CLASS 30B.

2.) UNIT DESIGNED HEAVY DUTY FOR A.A.S.H.T.O. H20-S16 WHEEL LOADS.

PATTERN # 2815 HEAVY DUTY CAST IRON FRAME & GRATE

DRAWN BY:	DRAWING #	DATE:
T.J.N.	2815	05/08/89

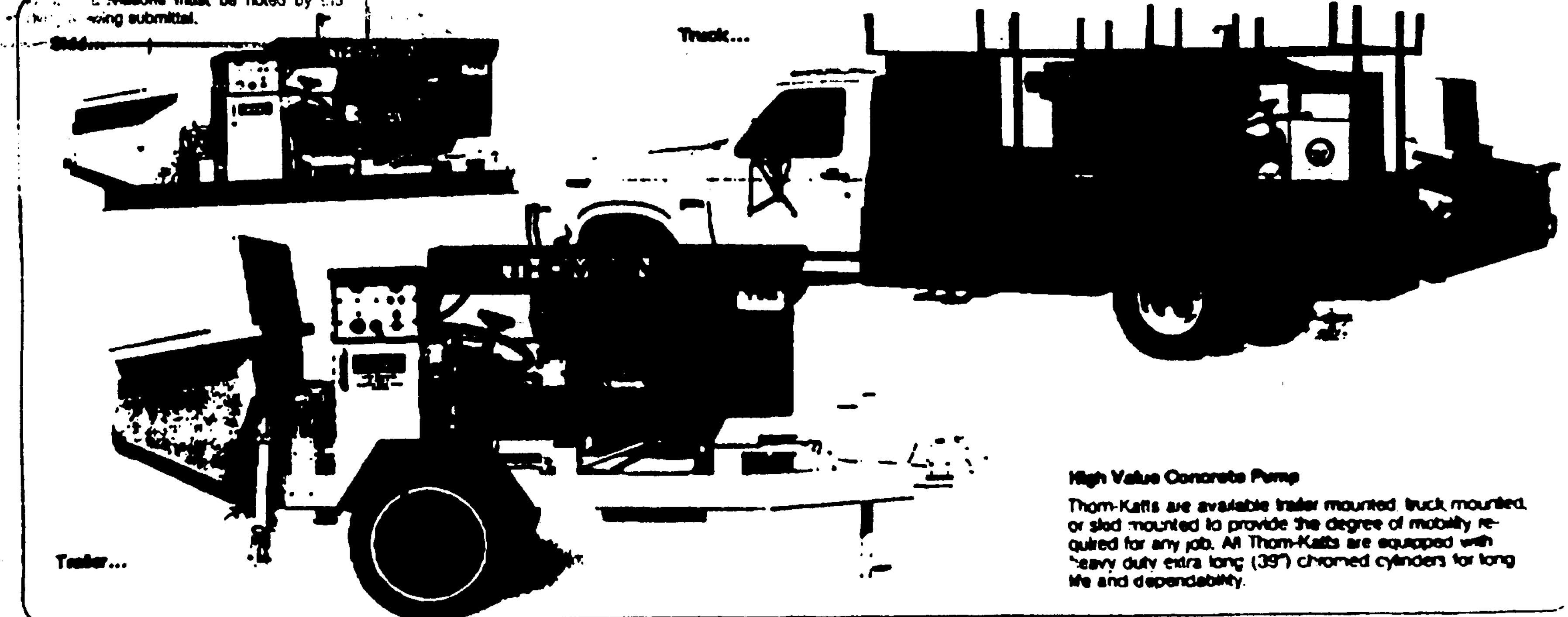
SC SC SYRACUSE CASTINGS SALES CORP.
MAIN OFFICE:
SOUTH BAY ROAD / P.O. BOX 190
CICERO, NEW YORK 13039
PHONE: 315-699-2601

EMCON
WORKING DRAWING REVIEW
☑ APPROVED ☐ REVISE & RESUBMIT
☐ APPROVED AS NOTED ☐ NOT APPROVED
PROJECT 8[illegible]-009.000
DATE SUBMITTED 7/24/97
DATE REVIEWED
CHECKED CPL
[illegible] compliance with design concept. [illegible], omissions and deviations [illegible] deviations must be noted by the [illegible] submittal.

Technical Data:

	Trailer Mtd.						Truck Mtd.		Sled Mtd.		
Model	TTS 2046(4)	TTS 2065(5)	TTS 2040(4)	TTS 2040(4W)	TTS 2025(E)	TTS 2016(4)	TVS 2045(4)	TVS 2065(5)	TSKS 2025(E)	TSKS 2045(4)	TSKS 2045(4W)
Output cu.yds per hr	46	65	40	40	25	16	45	65	25	45	45
Pressure on concrete	950	700	800	800	800	1530	950	700	800	950	950
Material cylinder diameter	6"	7"	6"	6"	6"	4"	6"	7"	5"	5"	6"
Max. hydraulic pressure	3500	3500	3000	3000	3000	2800	3500	3500	3000	3500	3500
Engine type	4cyl. Diesel	5cyl. Diesel	4cyl. Diesel	4cyl. D. (W)	Elect.	4cyl. Diesel	4cyl. Diesel	5cyl. Diesel	Elect.	4cyl. Diesel	4cyl. D. (W)
Engine hp	67	83	67	52	50	67	67	83	50	67	52

[illegible]



High Value Concrete Pump

Thom-Katts are available trailer mounted, truck mounted, or sled mounted to provide the degree of mobility required for any job. All Thom-Katts are equipped with heavy duty extra long (39") chromed cylinders for long life and dependability.

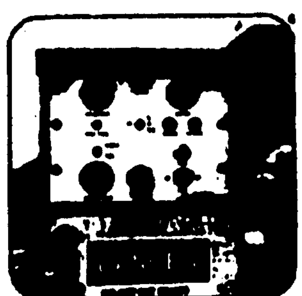
The Thom-Katt System

Thom-Katt is not only one simple good trailer pump. Thomsen's modular system allows various sizes, performances, sled, trailer or truck-mounted, even with boom on request.

The heart of all Thom-Katts is the 6" (150 mm) hard-chromed concrete cylinders long 39" (1 m) stroke, water-flushing box for cooling and easy piston exchange between both cylinders, and the famous S-valve hopper design, well-known already for many years, now improved by Thomsen with the famous magic seal ring. Wear parts still exchangeable with earlier models.

The standard 4-cylinder Diesel trailer unit TTS 2045 has simpler or stronger actions depending on the choice of engine and hydraulic pump — even with emission-controlled Deutz Diesel engine for mines. The smallest model has a smooth-running 4 cyl. Diesel with 67 hp. Versatility in sizes and a multitude of accessories for different applications.

Control panel has gauges for engine rpm, hydraulic pressure, and accumulator pressure. Controls for pumping direction, remote control operation, throttle, and starting.



3

4

Shotcrete

The world's most dependable concrete pump is also the world's most dependable shotcrete pump. Over the past twenty years, "wet mix" shotcrete has developed as an alternative to gunite (dry shotcrete) or form and pour. With advances in equipment, admixtures and mix designs, many jobs that have traditionally been form and pour are now being shotcreted. Tunnels and mines are today using shotcrete for permanent support as well as temporary linings. Schwing concrete pumps have long been known to be the most reliable on the market. Many Schwing pumps that are 15-20 years old are still used on the job today. The BPA 450 and 500 continue this history of reliable performance as concrete pumps or shotcrete machines.

Technical Data

BPA 450 & BPA 500	Standard	Metric
Theoretical Concrete Output, BPA 450	30 cu.y/hr.	23 cu.m/hr.
Theoretical Concrete Output, BPA 500	40 cu.y/hr.	31 cu.m/hr.
Max. Pressure on Concrete	1100 p.s.i.	76 bar.
Max. Horizontal Pumping Distance*	1000'	300 m.
Max. Vertical Pumping Distance*	300'	92 m.
Max. Aggregate Size*	1"	25 mm.
Min. Concrete Slump	0"	0 cm.
Pumping Cylinder Diameter	6"	150 mm.
Pumping Cylinder Length	39"	1000 mm.
Max. Pump Strokes/Min., BPA 450	24	24
Max. Pump Strokes/Min., BPA 500	30	30
Concrete Valve	Rock-S	Rock-S
Rock Valve Inlet Diameter	6"	150 mm.
Rock Valve Outlet Diameter	5"	130 mm.
Charging Hopper-Height (in.)	48"	1219 mm.
Diesel Powered , BPA 450	46 h.p.	34 kw.
Diesel Powered , BPA 500	57 h.p.	43 kw.
Fuel Tank Capacity	20 gal.	76 ltr.
Trailer Units Weight, BPA 450	4500 lbs.	2045 kg.
Trailer Units Weight, BPA 500	4800 lbs.	2181 kg.
Length	13'	380cm
Width	5'6"	165cm
Height	5'	152cm
Remote Control on/off wicable	100'	30 m

(Wireless Remote Control Optional)

*Pumping distances shown are to be used as a guide only since they have been consistently exceeded on operating projects. Maximum obtainable distances depend upon concrete mix design and pipeline diameter. Maximum output and distance cannot be achieved simultaneously. **Maximum slump and maximum aggregate size are dependent upon concrete mix design and pipeline diameter. Pump specifications are for standard units. Other units are available.

Specifications subject to change without notice.

Represented by

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PROJECT 86143-004.00
DATE SUBMITTED 7/24/92
DATE REVIEWED
CHECKED BY CPL

Approval is only for general compliance w...
Contractor is responsible for errors, o...
plans and specifications. Dev... be
Contractor on the working dra...

450-3/85-5M

SCHWING AMERICA INC.
SMALL LINE DIVISION

5900 Centerville Road
St. Paul, MN 55127
Tel. 800-237-8980
FAX 612-444-6905

ESSROC™

CEMENT TEST [illegible]

EMCON
WORKING DRAWING REVIEW

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PROJECT 8C143-0047000
DATE SUBMITTED 7/24/97
DATE REVIEWED
CHECKED BY CPL

Approval is only for general compliance with design concept. The Contractor is responsible for errors, omissions and deviations from plans and specifications. Deviations must be noted by the Contractor on the working drawing submittal.

Cement Type NYSDOT I/I[illegible]
Shipped To ESSROC Customers
Via Truck

Date [illegible] 1996
Sample Source 4032

PHYSICAL REQUIREMENTS

Specific Surface (Blaine)			400	m^2/kg
Autoclave Expansion			-0.01	%
Setting Time (Vicat) Initial		hrs.	150	mins.
Air Content Mortar			7.0	%

Compressive Strength:

1 day	1900	psi	7 days	4275	psi
3 days	3400	psi	28 days	N.A.	psi

CHEMICAL REQUIREMENTS

Silicon Dioxide (SiO_2)	21.3	%	Loss on Ignition	0.9	%
Aluminum Oxide (Al_2O_3)	4.5	%	Insoluble Residue	N.A.	%
Iron Oxide (Fe_2O_3)	3.7	%	C_3S	52	%
Sulfur Trioxide (SO_3)	2.8	%	C_3A	6.5	%
Magnesium Oxide (MgO)	2.2	%	Total Alkalies as Na_2O	0.65	%
Calcium Oxide (CaO)	63.6	%	False Set	69	%

SPECIFICATIONS

This cement has been tested to and complies with current:

XXXXX A.S.T.M. Standard C150

CERTIFIED [signature]
James D. Whiting P. Eng.
Technical Services Regional Manager

"As a part of its commitment to Total Customer Satisfaction, ESSROC offers free technical service to its customers. We have made every effort to insure the accuracy of the information provided to you. While this advice is intended to add value to your business, the formulation of concrete and/or mortar and the applications for which it is used must be the responsibility of the customer. Customer acknowledges this and agrees to accept ESSROC's technical advice at its own risk."

ESSROC Materials Inc., P.O. Box 12637, Rochester, New York 14612 Tel. 716-663-7272 Fax 716-663-2540

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PROJECT 96143-004.000
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DATE REVIEWED
CHECKED BY
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GRACE Concrete admixtures

darex·aea

AIR ENTRAINING ADMIXTURE
ASTM C 260
AASHTO M 154

DAREX® AEA® admixture is an aqueous solution of a complex mixture of organic acid salts. It contains a catalyst for more rapid and complete hydration of portland cement. DAREX AEA is specially formulated for use as an air entraining admixture for concrete and is manufactured under rigid control which provides uniform, predictable performance. It is supplied ready-to-use and does not require premixing with water. One gallon weighs approximately 8.5 lbs.

USES:

DAREX AEA is used in ready-mix, block, and concrete products plants. It is also used on the job with job-site mixers, highway pavers. . . wherever concrete is mixed and there is a need for purposeful air entrainment.

Because DAREX AEA plasticizes or "fattens" the mix, it is particularly effective with slag, lightweight, or manufactured aggregates which tend to produce harsh concrete. It also makes possible the use of natural sand deficient in fines.

AIR ENTRAINING ACTION:

Air is entrained by the development of a semi-microscopic bubble system—introduced into the mix by agitation and stabilized by DAREX AEA—in the mortar phase of the concrete.

Workability is improved. Millions of tiny air bubbles entrained with DAREX AEA act as flexible ball bearings, lubricating and plasticizing the concrete mix. This permits a substantial reduction in mixing water with no loss in slump. Placeability is improved. . . bleeding, green shrinkage and segregation are minimized.

Durability is increased. DAREX AEA concrete is extremely durable, particularly when subjected to freezing and thawing. It has resistance to frost and deicing salts, as well as to sulfate, sea and alkaline waters.

COMPATIBILITY WITH OTHER ADMIXTURES:

DAREX AEA is compatible in concrete with all known accelerating admixtures, water reducing admixtures and water reducing retarders. By combining the separate effects of air entrainment with the dispersion of a water reducing admixture, the water requirement of concrete may be reduced with proportional increases in strength and improvement in durability. EACH ADMIXTURE SHOULD BE ADDED SEPARATELY TO THE MIX.

ADDITION RATES:

There is no standard addition rate for DAREX AEA. The amount to be used will depend upon the amount of air required under job conditions, usually in the range of 4 to 8%. Typical factors which might influence the amount of air entrained are temperature, cement, sand gradation, and use of extra fine materials such as fly ash. Typical DAREX AEA addition rates range from ¼ to 3 fluid ounces per 100 lbs. of cement.

The air entraining efficiency of DAREX AEA becomes even greater when used with water reducing and set retarding agents. This may allow a reduction of up to two-thirds in the amount of DAREX AEA required for the specified air content.

MIX ADJUSTMENT:

Entrained air results in increased yields with a consequent decrease in the cement content of the placed concrete. This condition calls for a mix adjustment, usually accomplished by reducing the fine aggregate content. This is in addition to the reduction in water content brought about by the increase in plasticity.

DISPENSING EQUIPMENT:

A complete line of automatic DAREX AEA dispensers is available. Accurate and simple, these dispensers are easily adapted to existing facilities on paving mixers and in batching plants.

PACKAGING:

DAREX AEA is available in bulk, delivered in metered tank trucks, and 55-gallon drums. DAREX AEA contains no flammable ingredients. IT FREEZES AT ABOUT 30°F, BUT ITS AIR ENTRAINING PROPERTIES ARE COMPLETELY RESTORED BY THAWING AND THOROUGH AGITATION.

ARCHITECTS' SPECIFICATION FOR CONCRETE AIR ENTRAINING ADMIXTURE:

Concrete shall be air entrained concrete, containing 4 to 8% entrained air. The air contents in the concrete shall be determined by the pressure method (ASTM Designation C 231) or gravimetric method (ASTM Designation C 138). The air entraining admixture shall be a purified hydrocarbon type with a cement catalyst, such as DAREX AEA, as manufactured by the Construction Products Division of W.R. Grace & Co.-Conn., or equal. The air entraining admixture shall be added at the concrete mixer or batching plant at approximately ¼ to 3 fluid ounces per 100 lbs. of cement, or in such quantities as to give the specified air contents.

GRACE
Concrete Products

1018-07297

W.J. Peters Inspection Services, Inc.
6821A Basile Rowe
East Syracuse, New York 13057
(315) 463-0088

Client Order No. PO #1337
Order No. 3771
Date: 7/29/97
Date batched: 8/26/96

REPORT OF CONCRETE MIX DESIGN

Per W.F. Saunders & Sons, P.O. Box Drawer A, Nedrow, NY Date 7/29/97
Project Fayetteville Manlius School District
Concrete Supplier W.F. Saunders & Sons, Nedrow, NY
Architect/Engineer RSA Architects, Syracuse, NY
General Contractor Barry Bette & Led Duke, Watertown, NY

SPECIFICATION REQUIREMENTS

Strength 4000 psi Min. @ 28 days; Slump 3" in. Max.; Entr. Air 5.0 % to 7.0 %
Cement Type I/II ; Amt. 6.0 bags/cu. yd. Min.; W/C ACI
Aggregate (Kind and Size Range) Coarse Limestone #1's Fine ASTM C33
Admixture Air entraining and water reducer

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PROJECT 86143-004.000
DATE SUBMITTED 8/1/97
DATE REVIEWED
CHECKED BY CPL
Approval is only for general compliance with design concept. This Approval is only for general compliance with design concept. This plans and specifications on the working drawing submittal.

SOURCE OF MATERIALS

Cement Essroc Cement Co., Oswego, NY Admixture
Fine Aggregate W.F. Saunders & Sons, Marcellus, NY
Course Aggregate W.F. Saunders & Sons, Marcellus, NY
Admixture The W.R. Grace Co.

TRIAL BATCH QUANTITIES per CUBIC YARD

These batch weights will require adjustments to compensate for moisture in aggregates.

Cement Type I/II 564 lbs. 6.0 bags W/C .48 Total Water 272 lbs. 33.00 gals.
Fine Aggregate (S.S.D.) 1470 lbs. Admixture Darex II - .75 oz/sack
Course Aggregate (S.S.D.) #1's 1580 lbs. Admixture WRDA Eycol-3 oz/100 lbs cement
Course Aggregate (S.S.D.) lbs. Slump 3" in.; Entr. Air 6.0 %
These batch weights furnished by lbs. Fresh unit wt. 144.03 lbs./cu. ft.

COMPRESSION TEST RESULTS

Mix Identification Number	Laboratory Number	Test Age (Days)	Date of Test	Total Load (lbs)	Cyl Dia (in)	Cyl Area (in²)	Compressive Strength (psi)	Technician Initials
	79386	7	8/2/96	114,000	6.0	28.27	4030	
	79387	7	8/2/96	114,500	6.0	28.27	4050	
	79388	7	8/2/96	116,000	6.0	28.27	4100	
	79389	28	8/23/96	159,000	6.0	28.27	5620	
	79390	28	8/23/96	157,000	6.0	28.27	5550	
	79391	28	8/23/96	160,750	6.0	28.27	5690	

REMARKS: Mix #3 to be used for sidewalks. The dosage rate of air entraining admixture required to obtain the desired air content in the field may vary from the laboratory mix. Field tests should be conducted.
I/W.F. Saunders & Sons
I/Mix
pc

Submitted By: W.J. PETERS INSPECTION SERVICES
Walter J. Peters, President
Robert C. Walker, P.E.

P & S CONCRETE PRODUCTS LTD

R.D. #2 Lakeport Road, Chittenango, New York 13037
(315) 687-3093 • FAX: 687-5226

August 1, 1997

Re: Lockeed Martin Corp. Job Site

To Whom It May Concern:

Catch Basin Concrete Work Can Not Meet ACI 301-84 Specs For Structural Concrete For Building. This Requirement Does Not Apply Toward Catch Basins.

Peter J. Kilts,

EMCON
WORKING DRAWING REVIEW
☐ APPROVED ☐ REVISE & RESUMIT
☑ APPROVED AS NOTED ☐ NOT APPROVED
PROJECT 86143-004.000
DATE SUBMITTED 8/4/97
DATE REVIEWED
CHECKED BY CDL
Approval is on ~for gen. l compliance with design concept. The Contractor is r sponsible l r errors, omissions and deviations from plans and spe ifications. Deviations must be noted by the Contractor on the working drawing submittal.

TOTAL P.05

List of Subgrade Fill Sources:

Topsoil: W.F. Saunders or Jack Brown Sand & Gravel

Sand, Bank-Run Gravel, Stone, Rip-Rap: W.F. Saunders

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PROJECT 81.143-004.006
DATE SUBMITTED 7/24/97
DATE REVIEWED
CHECKED BY CPL
Approval is only for general compliance with design concept. The Contractor is responsible for errors, omissions and deviations from plans and specifications. Deviations must be noted by the Contractor on the working drawing submittal.

Concrete

TESTWELL CRAIG PETERS
Testing Laboratories, Inc.

1018-02205
(315) 463-0088
6521A Basile Rowe
East Syracuse, New York 13057

REPORT

TCP 3200
Lab. #3966

P.O. #1335

EMCON
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PROJECT 86.14 ... 004.000
DATE SUBMITTED ...
DATE REVIEWED ...
CHECKED BY CPL
Approval is only for general compliance with design concept. The Contractor is responsible for errors, omissions and deviations from plans and specifications. Deviations must be noted by the Contractor on the working drawing submittal.

RE: SIEVE ANALYSIS & WASH

PROJECT - Various Laboratory Testing 1995

DATE RECEIVED - 2-17-95

REPORTED TO - W. F. Saunders & Sons
P.O. Box Drawer A
Nedrow, N.Y. 13120

SAND

Source: W. F. Saunders & Sons, Marcellus, N.Y.

PASSING	PERCENT	ASTM C33
3/8"	100.0	100%
No. 4	99.4	95-100%
No. 8	83.7	80-100%
No. 16	65.6	50-85%
No. 30	52.3	25-60%
No. 50	28.8	10-30%
No. 100	9.7	2-10%
No. 200	2.8	3% Max.

Fineness Modulus: 2.61

Respectfully submitted,
TESTWELL CRAIG PETERS
TESTING LABORATORIES, INC.
Walter J. Peters, President

Robert C. Walker, P.E.

1/W.F. Saunders & Sons
1/TCP
am

TESTWELL CRAIG PETERS
Testing Laboratories, Inc.
P.O. #1335

CONCRETE

1079-02035
(315) 463-0088
6521A Basile Rowe
East Syracuse, New York 13057
TCP 3200
Lab.# 3923

REPORT

DESCRIPTION - SIEVE ANALYSIS AND WASH
PROJECT - Various Laboratory Testing 1995
MATERIAL - #1 Stone, Limestone
SOURCE - W. F. Saunders & Sons Pit
Marcellus, N.Y.
RECEIVED - 1-30-95
REPORTED TO - W. F. Saunders & Sons
P.O. Box Drawer A
Nedrow, New York 13120

SIEVE ANALYSIS

SIEVE SIZE	% PASSING	ASTM C-33 SPEC. #67	ASTM C-33 SPEC. #7
Passing 1" Sieve	100.0	100	-
Passing 3/4" "	100.0	90-100	100
Passing 1/2" "	88.0	-	90-100
Passing 3/8" "	49.1	20-55	40-70
Passing No. 4 "	1.5	0-10	0-15
Passing No. 8 "	0.7	0-5	0-5
Passing No. 200" (WASH)	0.4	0-1	0-1

Respectfully submitted,
TESTWELL CRAIG PETERS
TESTING LABORATORIES, INC.
Walter J. Peters, President

Robert C. Walker, P.E.

1/W.F. Saunders & Sons
1/TCP
am

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PROJECT 86143-004.000
DATE SUBMITTED 7/24/97
DATE REVIEWED
CHECKED BY CCL
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TESTWELL CRAIG PETERS
Testing Laboratories, Inc.
P.O. #1335

BACKFILL

1018-02205

[redacted]
6521A Basile Rowe
East Syracuse, New York 13057
TCP 3200
Lab. #3966

REPORT

DESCRIPTION - SIEVE ANALYSIS & WASH

PROJECT - Various Laboratory Testing 1995

DATE RECEIVED - 2-17-95

REPORTED TO - W. F. Saunders & Sons
P.O. Box Drawer A
Nedrow, N.Y. 13120

SAND

Source: W. F. Saunders & Sons, Marcellus, N.Y.

PASSING	PERCENT	ASTM C33
3/8"	100.0	100%
No. 4	99.4	95-100%
No. 8	83.7	80-100%
No. 16	65.6	50-85%
No. 30	52.3	25-60%
No. 50	28.8	10-30%
No. 100	9.7	2-10%
No. 200	2.8	3% Max.

Fineness Modulus: 2.61

Respectfully submitted,
TESTWELL CRAIG-PETERS
TESTING LABORATORIES, INC.
Walter J. Peters, President

Robert C. Walker, P.E.

1/W.F. Saunders & Sons
1/TCP
am

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PROJECT 86143-004.000
DATE SUBMITTED 4/24/97
DATE REVIEWED
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TESTWELL CRAIG PETERS
Testing Laboratories, Inc.

1079-02035
(315) 463-0088
6521A Basile Rowe
East Syracuse, New York 13057
TCP 3200
Lab.# 3924

BACKFILL

REPORT

P.O. #1335

DESCRIPTION - SIEVE ANALYSIS AND WASH
PROJECT - Various Laboratory Testing 1995
MATERIAL - #2 Stone, Limestone
SOURCE - W. F. Saunders & Sons Pit
Marcellus, N.Y.
RECEIVED - 1-30-95
REPORTED TO - W. F. Saunders & Sons
P.O. Box Drawer A
Nedrow, New York 13120

SIEVE ANALYSIS

SIEVE SIZE	PERCENT PASSING
Passing 1½" Sieve	100.0
Passing 1" "	93.0
Passing 3/4" "	60.9
Passing 1/2" "	3.1
Passing 3/8" "	1.0
Passing No. 4 "	0.6
Passing No. 200 " (WASH)	0.3

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PROJECT 86143-004.000
DATE SUBMITTED 7/24/97
DATE REVIEWED
CHECKED BY W. F. Saunders & Sons.
Approval is for general compliance with design concept. Contractor is responsible for errors, omissions and deviations from plans and specifications. Deviations must be noted on the Contractor on the working drawing submittal.

Respectfully submitted,
TESTWELL CRAIG PETERS
TESTING LABORATORIES, INC.
Walter J. Peters, President

Robert C. Walker, P.E.

TESTWELL CRAIG PETERS
Testing Laboratories, Inc.

(315) 463-0066
6521A Basile Rowe
East Syracuse, New York 13057

1079-04035

BACKFILL

REPORT

P.O. #1335

TCP 3200
Lab #3995
Reported: 4/4/95

DESCRIPTION	-	SIEVE ANALYSIS AND WASH
PROJECT	-	Various for Year 1995
MATERIAL	-	Bank Run Gravel (Fine)
SOURCE	-	W.F. Saunders & Sons, South Onondaga Pit
DATE RECEIVED	-	3/31/95
REPORTED TO	-	W.F. Saunders & Sons P.O. Box Drawer A Nedrow, NY 13120

SIEVE ANALYSIS

SIEVE SIZE	% PASSING
Passing 1½"	100.0
Passing 1"	92.9
Passing 3/4"	85.1
Passing 1/2"	71.0
Passing 3/8"	62.4
Passing 1/4"	49.2
Passing No. 4	42.6
Passing No. 8	33.1
Passing No. 16	23.9
Passing No. 40	8.5
Passing No. 50	6.5
Passing No. 100	5.2
Passing No. 200 (WASH)	4.4

EMCON
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☐ APPROVED AS NOTED ☐ NOT APPROVED
PROJECT 86143-009.000
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Respectfully submitted,
TESTWELL CRAIG PETERS
TESTING LABORATORIES, INC.
Walter J. Peters, President

1/W.F. Saunders & Sons
1/TCP
pb

1079-04075

TESTWELL CRAIG PETERS
Testing Laboratories, Inc.

8521A Basile Rowe
East Syracuse, New York 13057
(315) 463-0068

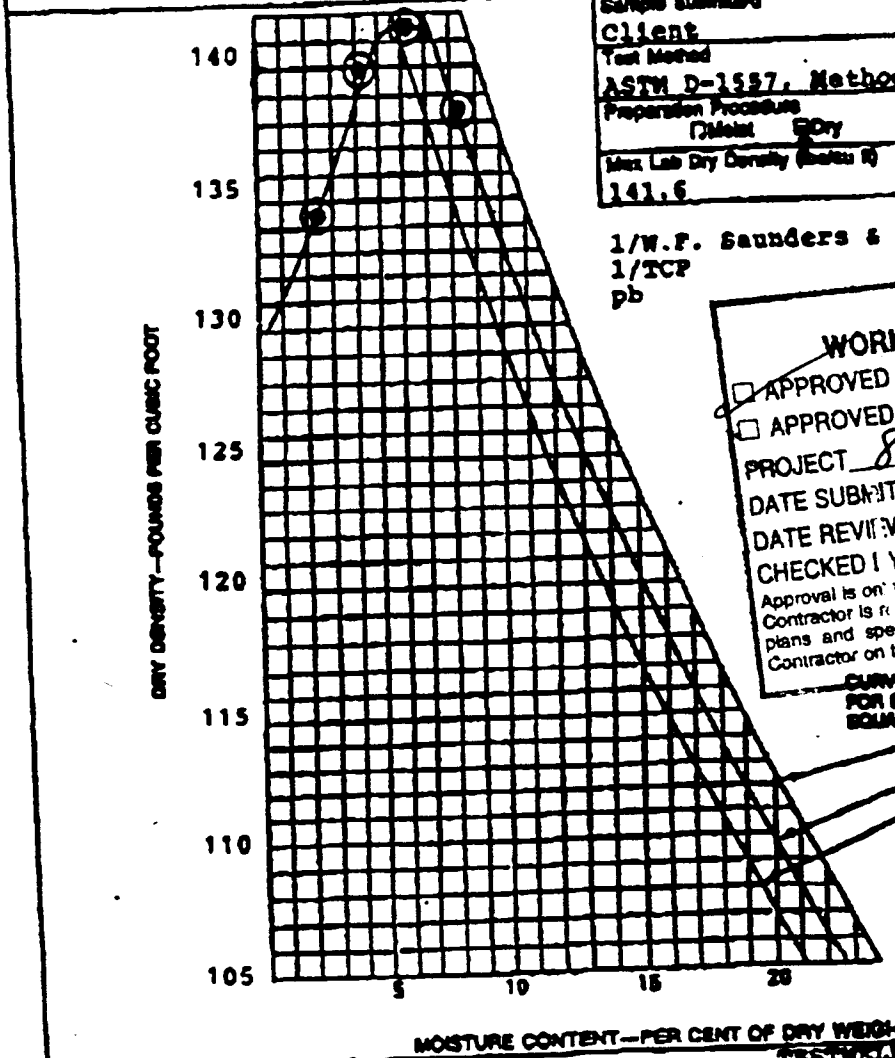
Client Order No.

Order No.

TEST REPORT

MOISTURE DENSITY RELATIONSHIP

Project: Various for Year 1995	Report Date: 4/12/95	Report No.: 2	Order No.: TCP 3200
	Client Order No.: P.O. #1335	Page: of	No.: 3995
Client: W.F. Saunders & Sons P.O. Box Drawer A Nedrow, NY 13120	Source of Sample: W.F. Saunders & Sons South Onondaga Pit		
	Soil Description: Bank Run Gravel (Fine)		
	Sample Submitted: Client	Date Sample Received: 3/31/95	
	Test Method: ASTM D-1557, Method "C"		
	Preparation Procedure: ☐Moist ☒Dry	Type of Rammer: ☒Manual ☐Mechanical	
	Max. Lab Dry Density (Solids) lb/cu ft: 141.6	Optimum Moisture (%): 6.2	



1/W.F. Saunders & Sons
1/TCP
pb

EMCON
WORKING DRAWING REVIEW
☐ APPROVED ☐ REVISE & RESUBMIT
☐ APPROVED AS NOTED ☐ NOT APPROVED
PROJECT 86143-004.006
DATE SUBMITTED 7/24/97
DATE REVIEWED
CHECKED BY CPL
Approval is only for general compliance with design concept. The Contractor is responsible for errors, omissions and deviations from plans and specifications. Deviations must be noted by the Contractor on the working drawing submittal.

Submitted By: TESTWELL CRAIG PETERS TESTING LABORATORIES, INC.
Walter J. Peters, President

F-6

K

MACCAFERRI GABIONS, INC.

Gabions & Reno Mattresses

Gabions & Reno Mattresses are.

rectangular baskets made of heavily galvanized, double twisted, hexagonal woven steel wire mesh. The single unit constructed baskets are assembled, laced together and then filled with stone to form a monolithic structure. Gabions and Reno Mattresses are used for retaining walls, sound barriers, channel linings, slope stabilization, mechanically reinforced soils, dams and weirs. They are particularly effective in restoring the environment and promoting vegetation growth. Our mesh is also used very successfully for rock fall protection.

Please inquire about our new Terramesh System.

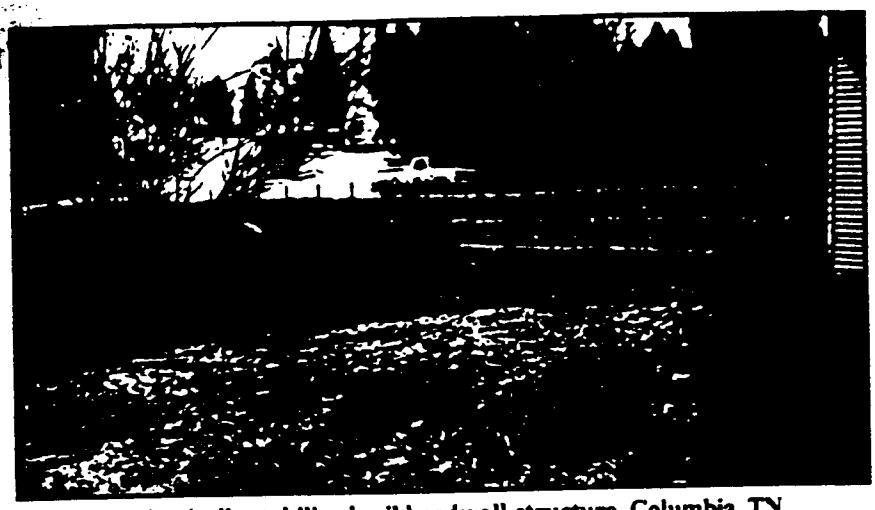


Fig. 1 Mechanically stabilized soil headwall structure, Columbia, TN.

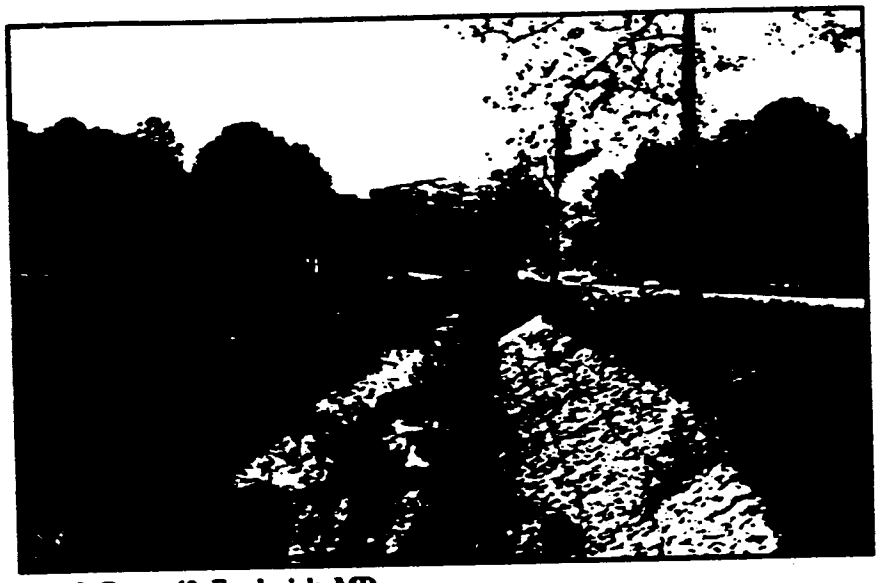


Fig. 2 Route 40, Frederick, MD.

Characteristics

FLEXIBILITY—The woven mesh system has the capability of withstanding unexpected and/or localized stresses due to ground settlement and scour by deflection while maintaining its structural integrity.

ECONOMICAL & EASY TO BUILD—Gabions and Reno Mattresses are one of the most economical methods of construction for temporary and permanent structures. Gabion construction does not require skilled labor or previous experience. Standard construction machinery can be used and work can proceed year round. Structures can be built in stages, if necessary, and baskets can be prefilled to enable installation under water.

Site assistance is available from any Maccaferri area office.

PERMEABILITY—The stone fill allows water to percolate through the structure while retaining the soil, therefore weep holes are not required to relieve hydrostatic pressures.

ENVIRONMENTALLY FRIENDLY—Gabions and Reno Mattresses are environmentally friendly products. The blending of Gabion and Reno Mattress structures into the environment is rapid and pleasing. The voids in the rockfill become progressively filled with silt promoting vegetation growth which is essential to the preservation and maintenance of the ecological balance of the surrounding environment.

Due to their proven success Maccaferri products are approved by Federal, State and Local Authorities.

Fig. 3 River wall at South Bend, IN.

PVC Coated Wire Mesh

To extend the life span of a structure used in water, polluted or corrosive environments Gabions and Reno Mattresses can be supplied with an additional grey PVC coating.

Fastening Tools...

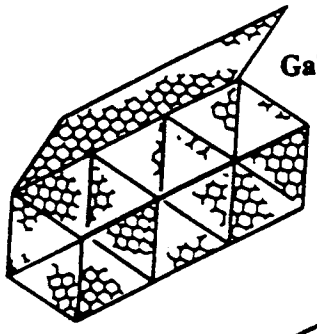
The ultimate alternative to hand lacing! Consider the use of pneumatic or hand fastening tools instead of lacing wire to expedite your construction operations. The hand lacing time for assembly and installation operations can be reduced up to 50% with the use of our fastening system. The rings can be either heavily galvanized or stainless steel. The latter for use with PVC coated gabions.

Fig. 4 Use of pneumatic fastening tool on job site.

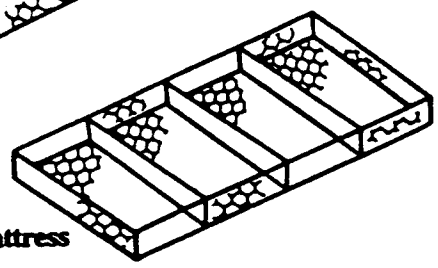
GABIONS — Nominal Sizes

Zinc coated and PVC coated

Letter Code	Length	3' Width	Height	No. of Cells	Capacity Cu. Yds.	Color Code
A	6'	3'	3'	2	2.0	Blue
B	9'	3'	3'	3	3.0	White
C	12'	3'	3'	4	4.0	Black
D	6'	3'	1.5'	2	1.0	Red
E	9'	3'	1.5'	3	1.5	Green
F	12'	3'	1.5'	4	2.0	Yellow
G	6'	3'	1'	2	0.66	Blu/Red
H	9'	3'	1'	3	1.0	Blu/Yel
I	12'	3'	1'	4	1.33	Blu/Grn
SP	4.5'	3'	3'	1	1.5	Brown



Gabion



Reno Mattress

RENO MATTRESS — Nominal Sizes

Zinc coated and PVC coated

Letter Code	Length	Width	Thickness	No. of Cells	Area Sq. Yds.	Capacity Cu. Yds.	Color Code
Q	9'	6'	6"	3	6	1.00	Whi/Yel
R	12'	6'	6"	4	8	1.33	Whi/Grn
T	9'	6'	9"	3	6	1.5	Red/Yel
U	12'	6'	9"	4	8	2.0	Red/Grn
Z	12'	6'	12"	4	8	2.67	Brown

Metric sizes are also available.
Please inquire about special sizes.

THE MACCAFERRI GROUP has been manufacturing gabion products for over 100 years. As the leading manufacturer of gabion products, our experience in the area of specifications, technical publications, videos and computer aided designs are available to you by contacting the Maccaferri area office address listed below.

EMCON

WORKING DRAWING REVIEW

☑ APPROVED ☐ REVISE & RESUMIT

☐ APPROVED AS NOTED ☐ NOT APPROVED

PROJECT 86143-004.006

DATE SUBMITTED 7/24/97

DATE REVIEWED _____

CHECKED BY CDL

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MACCAFERRI GABIONS, INC.

MACCAFERRI GABIONS, INC.
10303 GOVERNOR LANE BLVD.
WILLIAMSPORT, MD 21795-9602
TELEPHONE: (301) 223-6910
FAX: (301) 223-6134

MACCAFERRI GABIONS, INC.
3650 SEAPORT BLVD.
WEST SACRAMENTO, CA 95691-0410
TELEPHONE: (916) 371-5805
FAX: (916) 371-0764

VILLAGE GARDEN STORE, LTD.
3830 Rush Mendon Road
P.O. Box 209
Mendon. New York 14506
(716) 624-1950

July 28, 1997

Re: Spec Mix - Court Street Project
Syracuse, New York

Mixture	Rate per Acre (lbs)
Creeping Red Fescue or Tall Fescue	80 - 57%
Perennial Ryegrass	20 - 14%
Birdsfoot Treefoil	40 - 29%
	140

EMCON
WORKING DRAWING REVIEW
☒ APPROVED ☐ REVISE & RESUMIT
☐ APPROVED AS NOTED ☐ NOT APPROVED
PROJECT 86143-009006
DATE SUBMITTED 7/24/97
DATE REVIEWED
CHECKED BY
Approval is only for general compliance with design concept. The Contractor is responsible for errors, omissions and deviations from plans and specifications. Deviations must be noted by the Contractor on the working drawing submittal.

Here you go Kevin Syracuse

thank you

William E. Smith

APPENDIX C

CONSTRUCTION PHOTOGRAPHS

Storm sewer replacement activities, northwest storm drain system

Storm sewer replacement activities, northwest storm drain system

Trench backfill and seepage barrier

Seepage barrier formwork, typical

Water main/sanitary sewer crossing

Water main/sanitary sewer crossing

Completed seepage barrier

Completed seepage barrier/concrete encasement at water main crossing

Catch Basin 5 prior to replacement

New Catch Basin 5 installation

Catch Basin 5 pavement restoration

Northwest area pavement restoration

OF-01A

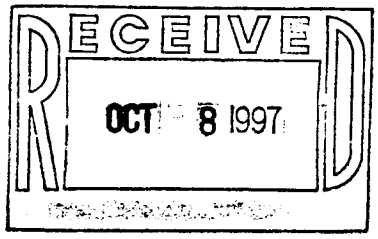
OF-01A

APPENDIX D

LABORATORY DATA

Columbia Analytical Services inc.

A FULL SERVICE ENVIRONMENTAL LABORATORY



October 2, 1997

Mr. Curtis Taylor
EMCON
Crossroads Corp. Center
1 International Blvd, Ste. 700
Mahwah, NJ 07495

PROJECT:LMC SYRACUSE
Submission #:9709000121

Dear Mr. Taylor

Enclosed are the analytical results of the analyses requested. All data has been reviewed prior to report submission. Should you have any questions please contact me at (716) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Mark Wilson
Client Service Manager

Enc.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director prior to report submittal. MW 10/2/97

1 Mustard St.• Suite 250 • Rochester, NY 14609 • Tele:(716)288-5380 • Fax:(716)288-8475
65 Ramapo Valley Rd. • Suite 16 • Mahwah, NJ 07430 • Tele:(201)512-3292 • Fax:(201)512-3362
12699 Roll Rd. • Akron, NY 14001 • Tele:(716)542-1264 • Fax:(716)542-3353

CASE NARRATIVE

COMPANY: EMCON
Lockheed Martin Corp - Syracuse
SUBMISSION #: 9709000121

EMCON water samples were collected on 09/05/97 and received at CAS on 09/06/97 in good condition. See the CAS Batching form to cross reference between Client ID and CAS sample numbers.

VOLATILE ORGANICS

Three water samples were analyzed for Target Compound List (TCL) of volatile organics by method 95-4 from the NYSASP 1995.

Sample OF02 was analyzed for site specific QC. All matrix spike recoveries and %RPD were within QC Limits. All Blank Spike recoveries were within QC limits.

All tuning criteria for BFB were met.

The initial and continuing calibration criteria were met for all analytes.

All surrogate standard recoveries were within acceptance limits.

All internal standard areas were within QC Limits.

All samples were analyzed within the holding time as specified in the method.

No other analytical or QC problems were encountered.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Michael K. Perry
Laboratory Director

10/1/97
Date

* 00001

1 Mustard Street, Suite 250 ▪ P.O. Box 90859 ▪ Rochester, NY 14609-0859 ▪ Telephone 716/288-5380 ▪ Fax 716/288-8475

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DUP

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: 166466 1.0

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6127.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
75-01-4	Vinyl Chloride	1	U
74-83-9	Bromomethane	1	U
75-00-3	Chloroethane	1	U
67-64-1	Acetone	5	U
75-35-4	1,1-Dichloroethene	0.9 (R) Ø	J
75-09-2	Methylene Chloride	1	U
75-15-0	Carbon Disulfide	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
75-35-3	1,1-Dichloroethane	12	
78-93-3	2-Butanone	5	U
156-59-4	cis-1,2-Dichloroethene	0.5 (R) Ø	J
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
71-55-6	1,1,1-Trichloroethane	2	
56-23-5	Carbontetrachloride	1	U
71-43-2	Benzene	1	U
79-01-6	Trichloroethene	0.5 (R) Ø	J
78-87-5	1,2-Dichloropropane	1	U
75-27-4	Bromodichloromethane	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
10061-02-6	trans-1,3-Dichloropropene	1	U
108-88-3	Toluene	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-00-5	1,1,2-Trichloroethane	1	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
124-48-1	Dibromochloromethane	1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
75-25-2	Bromoform	1	U

(R) 9/23

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

DUP

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: 166466 1.0

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6127.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NO.	COMPOUND	RT	EST. CONC.	Q

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

OF02

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: 166465 1.0

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6124.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
75-01-4	Vinyl Chloride	1	U
74-83-9	Bromomethane	1	U
75-00-3	Chloroethane	1	U
67-64-1	Acetone	5	U
75-35-4	1,1-Dichloroethene	0.8 B ~~0~~	J
75-09-2	Methylene Chloride	1	U
75-15-0	Carbon Disulfide	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
75-35-3	1,1-Dichloroethane	12	
78-93-3	2-Butanone	5	U
156-59-4	cis-1,2-Dichloroethene	0.5 B ~~0~~	J
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
71-55-6	1,1,1-Trichloroethane	2	
56-23-5	Carbontetrachloride	1	U
71-43-2	Benzene	1	U
79-01-6	Trichloroethene	0.5 B ~~0~~	J
78-87-5	1,2-Dichloropropane	1	U
75-27-4	Bromodichloromethane	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
10061-02-6	trans-1,3-Dichloropropene	1	U
108-88-3	Toluene	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-00-5	1,1,2-Trichloroethane	1	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
124-48-1	Dibromochloromethane	1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
75-25-2	Bromoform	1	U

9/23

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OF02

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: 166465 1.0

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6124.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NO.	COMPOUND	RT	EST. CONC.	Q

B9/23

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

TB01

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: 166467 1.0

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6128.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
75-01-4	Vinyl Chloride	1	U
74-83-9	Bromomethane	1	U
75-00-3	Chloroethane	1	U
67-64-1	Acetone	5	U
75-35-4	1,1-Dichloroethene	1	U
75-09-2	Methylene Chloride	1	U
75-15-0	Carbon Disulfide	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
75-35-3	1,1-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
156-59-4	cis-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbontetrachloride	1	U
71-43-2	Benzene	1	U
79-01-6	Trichloroethene	1	U
78-87-5	1,2-Dichloropropane	1	U
75-27-4	Bromodichloromethane	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
10061-02-6	trans-1,3-Dichloropropene	1	U
108-88-3	Toluene	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-00-5	1,1,2-Trichloroethane	1	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
124-48-1	Dibromochloromethane	1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
75-25-2	Bromoform	1	U

9/23

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB01

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: 166467 1.0

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6128.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 1

CAS NO.	COMPOUND	RT	EST. CONC.	Q
1.	UNKNOWN	26.08	1	J

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CBLK

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: 166468 1.0

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6129.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
75-01-4	Vinyl Chloride	1	U
74-83-9	Bromomethane	1	U
75-00-3	Chloroethane	1	U
67-64-1	Acetone	5	U
75-35-4	1,1-Dichloroethene	1	U
75-09-2	Methylene Chloride	1	U
75-15-0	Carbon Disulfide	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
75-35-3	1,1-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
156-59-4	cis-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbontetrachloride	1	U
71-43-2	Benzene	1	U
79-01-6	Trichloroethene	1	U
78-87-5	1,2-Dichloropropane	1	U
75-27-4	Bromodichloromethane	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
10061-02-6	trans-1,3-Dichloropropene	1	U
108-88-3	Toluene	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-00-5	1,1,2-Trichloroethane	1	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
124-48-1	Dibromochloromethane	1	U
108-90-7	Chlorobenzene	1	U
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
75-25-2	Bromoform	1	U

CR 9/23

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

CBLK

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: 166468 1.0

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6129.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 0

CAS NO.	COMPOUND	RT	EST. CONC.	Q

GC 9/23

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

	EPA SAMPLE NO.	SMC1 #	TOT OUT
01	VBLK	102	0
02	LCS	93	0
03	OF02	101	0
04	OF02MS	104	0
05	OF02MSD	105	0
06	DUP	101	0
07	TB01	104	0
08	CBLK	104	0

SMC1 = SURR2,BFB QC LIMITS (80-120)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

8/9/23

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix Spike - EPA Sample No.: OF02

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	5.0	0.81	6.2	108	61 - 145
Benzene	5.0	0.0	5.8	116	76 - 127
Trichloroethene	5.0	0.50	5.9	108	71 - 120
Toluene	5.0	0.0	5.0	100	76 - 125
Chlorobenzene	5.0	0.0	4.8	96	75 - 130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	5.0	6.4	112	4	14	61 - 145
Benzene	5.0	5.7	114	2	11	76 - 127
Trichloroethene	5.0	5.8	106	2	14	71 - 120
Toluene	5.0	5.1	102	2	13	76 - 125
Chlorobenzene	5.0	4.9	98	2	13	75 - 130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits

Spike Recovery: 0 out of 10 outside limits

COMMENTS: _____

_____

8/4/27

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

OF02MS

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: 166465 1.0MS

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6125.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	1	U
75-01-4	Vinyl Chloride	1	U
74-83-9	Bromomethane	1	U
75-00-3	Chloroethane	1	U
67-64-1	Acetone	5	U
75-35-4	1,1-Dichloroethene	6	
75-09-2	Methylene Chloride	1	U
75-15-0	Carbon Disulfide	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
75-35-3	1,1-Dichloroethane	12	
78-93-3	2-Butanone	5	U
156-59-4	cis-1,2-Dichloroethene	0.5	J
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
71-55-6	1,1,1-Trichloroethane	2	
56-23-5	Carbontetrachloride	1	U
71-43-2	Benzene	6	
79-01-6	Trichloroethene	6	
78-87-5	1,2-Dichloropropane	1	U
75-27-4	Bromodichloromethane	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
10061-02-6	trans-1,3-Dichloropropene	1	U
108-88-3	Toluene	5	
10061-01-5	cis-1,3-Dichloropropene	1	U
79-00-5	1,1,2-Trichloroethane	1	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
124-48-1	Dibromochloromethane	1	U
108-90-7	Chlorobenzene	5	
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
75-25-2	Bromoform	1	U

9/23

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

OF02MSD

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: 166465 1.0MS

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6126.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
75-01-4	Vinyl Chloride	1	U
74-83-9	Bromomethane	1	U
75-00-3	Chloroethane	1	U
67-64-1	Acetone	5	U
75-35-4	1,1-Dichloroethene	6	
75-09-2	Methylene Chloride	1	U
75-15-0	Carbon Disulfide	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
75-35-3	1,1-Dichloroethane	12	
78-93-3	2-Butanone	5	U
156-59-4	cis-1,2-Dichloroethene	0.5 R ~~0~~	J
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
71-55-6	1,1,1-Trichloroethane	2	
56-23-5	Carbontetrachloride	1	U
71-43-2	Benzene	6	
79-01-6	Trichloroethene	6	
78-87-5	1,2-Dichloropropane	1	U
75-27-4	Bromodichloromethane	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
10061-02-6	trans-1,3-Dichloropropene	1	U
108-88-3	Toluene	5	
10061-01-5	cis-1,3-Dichloropropene	1	U
79-00-5	1,1,2-Trichloroethane	1	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
124-48-1	Dibromochloromethane	1	U
108-90-7	Chlorobenzene	5	
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
75-25-2	Bromoform	1	U

R 9/23

4A

VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLK

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Lab File ID: R6121.D Lab Sample ID: VBLK

Date Analyzed: 09/12/97 Time Analyzed: 14:57

GC Column: RTX502. ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: GCMS#5

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS	LCS	R6123.D	16:46
02	OF02	166465 1.0	R6124.D	17:32
03	OF02MS	166465 1.0MS	R6125.D	18:07
04	OF02MSD	166465 1.0MSD	R6126.D	18:43
05	DUP	166466 1.0	R6127.D	19:18
06	TB01	166467 1.0	R6128.D	19:53
07	CBLK	166468 1.0	R6129.D	20:28

COMMENTS

9/23

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: VBLK

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6121.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	Q
74-87-3	Chloromethane	1 U
75-01-4	Vinyl Chloride	1 U
74-83-9	Bromomethane	1 U
75-00-3	Chloroethane	1 U
67-64-1	Acetone	5 U
75-35-4	1,1-Dichloroethene	1 U
75-09-2	Methylene Chloride	1 U
75-15-0	Carbon Disulfide	1 U
156-60-5	trans-1,2-Dichloroethene	1 U
75-35-3	1,1-Dichloroethane	1 U
78-93-3	2-Butanone	5 U
156-59-4	cis-1,2-Dichloroethene	1 U
67-66-3	Chloroform	1 U
107-06-2	1,2-Dichloroethane	1 U
71-55-6	1,1,1-Trichloroethane	1 U
56-23-5	Carbontetrachloride	1 U
71-43-2	Benzene	1 U
79-01-6	Trichloroethene	1 U
78-87-5	1,2-Dichloropropane	1 U
75-27-4	Bromodichloromethane	1 U
108-10-1	4-Methyl-2-Pentanone	5 U
10061-02-6	trans-1,3-Dichloropropene	1 U
108-88-3	Toluene	1 U
10061-01-5	cis-1,3-Dichloropropene	1 U
79-00-5	1,1,2-Trichloroethane	1 U
591-78-6	2-Hexanone	5 U
127-18-4	Tetrachloroethene	1 U
124-48-1	Dibromochloromethane	1 U
108-90-7	Chlorobenzene	1 U
100-41-4	Ethylbenzene	1 U
100-42-5	Styrene	1 U
79-34-5	1,1,2,2-Tetrachloroethane	1 U
75-25-2	Bromoform	1 U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: VBLK

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6121.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Number TICs found: 10 (R)

CAS NO.	COMPOUND	RT	EST. CONC.	Q
~~1.~~		~~.00~~	~~000000000~~	~~U~~

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

LCS

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Matrix: (soil/water) WATER Lab Sample ID: LCS

Sample wt/vol: 25.0 (g/ml) ML Lab File ID: R6123.D

Level: (low/med) LOW Date Received: 09/06/97

% Moisture: not dec. _____ Date Analyzed: 09/12/97

GC Column: RTX502. ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	7	
75-01-4	Vinyl Chloride	8	
74-83-9	Bromomethane	10	
75-00-3	Chloroethane	7	
67-64-1	Acetone	5	U
75-35-4	1,1-Dichloroethene	5	
75-09-2	Methylene Chloride	5	
75-15-0	Carbon Disulfide	1	U
156-60-5	trans-1,2-Dichloroethene	6	
75-35-3	1,1-Dichloroethane	5	
78-93-3	2-Butanone	5	U
156-59-4	cis-1,2-Dichloroethene	5	
67-66-3	Chloroform	5	
107-06-2	1,2-Dichloroethane	5	
71-55-6	1,1,1-Trichloroethane	5	
56-23-5	Carbontetrachloride	5	
71-43-2	Benzene	6	
79-01-6	Trichloroethene	5	
78-87-5	1,2-Dichloropropane	5	
75-27-4	Bromodichloromethane	5	
108-10-1	4-Methyl-2-Pentanone	5	U
10061-02-6	trans-1,3-Dichloropropene	5	
108-88-3	Toluene	5	
10061-01-5	cis-1,3-Dichloropropene	5	
79-00-5	1,1,2-Trichloroethane	5	
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	5	
124-48-1	Dibromochloromethane	5	
108-90-7	Chlorobenzene	5	
100-41-4	Ethylbenzene	5	
100-42-5	Styrene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	5	
75-25-2	Bromoform	5	

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Lab File ID (Standard): R6120.D Date Analyzed: 09/12/97

Instrument ID: GCMS#5 Time Analyzed: 13:49

GC Column: RTX502.2 ID: 0.53 (mm) Heated Purge (Y/N): N

		IS1 AREA #	RT #	IS2 AREA #	RT #	IS3 AREA #	RT #
	12 HOUR STD	185969	10.67	256793	12.85	140760	19.78
	UPPER LIMIT	371938	10.17	513586	12.35	281520	19.28
	LOWER LIMIT	92985	11.17	128397	13.35	70380	20.28
	EPA SAMPLE NO.						
01	VBLK	190162	10.68	267581	12.86	151355	19.75
02	LCS	183159	10.67	256679	12.82	140959	19.75
03	OF02	182352	10.69	259567	12.87	143673	19.82
04	OF02MS	182238	10.68	259955	12.84	145869	19.77
05	OF02MSD	181035	10.65	255311	12.83	147598	19.78
06	DUP	179910	10.69	259091	12.87	146144	19.80
07	TB01	186149	10.67	258841	12.84	143274	19.81
08	CBLK	194611	10.67	272014	12.83	150385	19.76

IS1 = Pentafluorobenzene
IS2 = 1,4-Difluorobenzene
IS3 = d5-Chlorobenzene
IS4 = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column to be used to flag values outside QC limit with an asterisk.
* Values outside of contract required QC limits

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: CAS\ROC Contract: EMCON

Lab Code: 10145 Case No.: 97-9-121 SAS No.: _____ SDG No.: OF02

Lab File ID (Standard): R6120.D Date Analyzed: 09/12/97

Instrument ID: GCMS#5 Time Analyzed: 13:49

GC Column: RTX502.2 ID: 0.53 (mm) Heated Purge (Y/N): N

		IS4 AREA #	RT #	AREA #	RT #	AREA #	RT #
	12 HOUR STD	46336	25.68				
	UPPER LIMIT	92672	25.18				
	LOWER LIMIT	23168	26.18				
	EPA SAMPLE NO.						
01	VBLK	50860	25.68				
02	LCS	48559	25.65				
03	OF02	50279	25.69				
04	OF02MS	48405	25.68				
05	OF02MSD	49185	25.67				
06	DUP	49962	25.67				
07	TB01	49687	25.72				
08	CBLK	50900	25.66				

IS1 = Pentafluorobenzene
IS2 = 1,4-Difluorobenzene
IS3 = d5-Chlorobenzene
IS4 = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column to be used to flag values outside QC limit with an asterisk.
* Values outside of contract required QC limits