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OCCIDENTAL CHEMICAL CORPORATION

OLIN CORPORATION

FINAL CLOSEOUT REPORT

100TH STREET STORM SEWER ABANDONMENT AND RELOCATION

OPERABLE UNIT 3

102nd STREET LANDFILL SITE

NIAGARA FALLS, NEW YORK

June 22, 1998

FLUOR DANIEL GTI

Marlton, New Jersey

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Olin CHEMICALS
P.O. BOX 248, 1186 LOWER RIVER ROAD, CHARLESTON, TN 37310
Phone: (615) 336-4000

June 22, 1998

Mr. Paul Olivo, Proj. Mgr.
New York/Caribbean Response Superfund Branch II
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
290 Broadway
New York, NY 10007-1866

RE: 102nd Street Landfill Site, Niagara Falls, NY
Final Closeout Report and Remedial Action Report
100th Street Storm Sewer Abandonment and Relocation
Operable Unit 3

Dear Mr. Olivo:

Enclosed are three (3) copies of the signed and sealed final version of the Final Closeout Report for Operable Unit 3 at the 102nd Street Landfill Site, dated June 22, 1998 (the "Report"). It includes, as an attachment, the revised Remedial Action Report for Operable Unit 3. The Remedial Action Report along with the associated drawings have been revised to address the comments received in the June 9, 1998 U.S. Environmental Protection Agency (USEPA) correspondence. The responses to comments have also been attached to this letter. The contents of the USEPA comments have been included and incorporated into this final version of the Report.

We believe the final version of this Report is thorough and complete, addresses the USEPA June 9, 1998 comments and meets the requirements of the USEPA guidance, however should you have any questions or comments, please contact us at 423/336-4549 or 716/773-8304.

Very truly yours,

for David L. Cummings
Manager, Environmental Remediation
Olin Corporation

for James C. Thornton, P.E.
Project Manager
Glenn Springs Holdings, Inc.

cc: Gary Kline - NYDEC (6 encl.)
Vincent Funigello - Malcolm Pirnie (3 encl.)

existing storm drain with 42" RCP west of existing manhole MH-2. Installed approximately 20 LF of new 42" RCP east of existing manhole MH-2 to Manhole SDMH-5 for a total of approximately 50 LF of new 42" RCP installed.

Comment 6: *Remedial Action Report, Page 11, Section 4.4; Drawing 30K-04C*

On Page 11, the 3rd paragraph of Section 4.4 states "An approximately 20 foot section of existing 42-inch RCP that ran south from former MH-2..." and Drawing 30K-04C states "Replaced Approx. 15 LF of exist. 42" storm drain and exist. MH-2." The Companies shall Correct these inconsistencies.

Response: The 3rd paragraph has been revised as follows: Also, an approximately 15 foot section of existing 42" RCP that traversed the Site in a southerly direction from existing MH-2 was removed to facilitate installation of the slurry wall...

Drawing 30K-04C states: Removed approximately 15 LF of existing storm drain and existing MH-2, and Note 7 has been revised as follows: Removed MH-2 and approximately 15 LF of existing 42" RCP that ran south from existing MH-2 and traversed the Site.

Comment 7: *Remedial Action Report, Page 12, Section 4.4*

On page 12, the 5th paragraph of Section 4.4 states "The installation of CB-7 is a field change and was documented in the FCA (Appendix G)." This field change approval shall be included in Appendix E and "(Appendix G)" shall be changed to "(Appendix G)." The Companies shall correct these inconsistencies.

Response: This has been changed to show that Field Change Approvals are in Appendix E, not Appendix G.

Comment 8: *Remedial Action Report, Page 12, Section 4.4*

On page 12, the description of the bedding material in 6th paragraph of Section 4.4 shall be revised by the Companies to reflect the two different bedding details on Drawing 30K-13.

Response: This paragraph has been revised to reference both bedding material details.

Comment 9: *Remedial Action Report, Page 12, Section 4.4*

Laboratory strength test results are included in Appendix D, not Appendix E, as stated in the 7th paragraph of Section 4.4 on Page 12. The Companies shall correct this inconsistency.

Response: This has been changed to show that laboratory strength test results are in Appendix D, not Appendix E.

Comment 10: *Remedial Action Report, Page 13, Section 4.4*

Compaction test results are included in Appendix C, not Appendix D, as stated in the 7th paragraph of Section 4.4 on Page 13. The Companies shall correct this inconsistency.

Response: This has been changed to show that compaction test results are in Appendix C, not Appendix D.

Comment 11: *Remedial Action Report, Page 13, Section 4.4*

Field Change Approvals are included in Appendix E, not Appendix G, as stated in the 8th paragraph of Section 4.4 on Page 13. The Companies shall correct this inconsistency.

Response: This has been changed to show that Field Change Approvals are in Appendix E, not Appendix G.

Comments 12: *Remedial Action Report, Page 14, Section 4.8*

Data verification reports are included in Appendix B, not Appendix C, as stated in the 1st paragraph of Section 4.8 on Page 14. The Companies shall correct this inconsistency.

Response: This has been changed to show that data verification results are in Appendix B, not Appendix C.

Comment 13: *Remedial Action Report, Page 15, Section 4.8*

Compaction test results are included in Appendix C, not Appendix D, as stated in the 2nd paragraph of Section 4.8 on Page 15. The Companies shall correct this inconsistency.

Response: This has been changed to show that compaction test results are in Appendix C, not Appendix D.

Comment 14: *Remedial Action Report, Page 15, Section 4.8*

Field change approval dated 8/9/96 states that the formed invert flow channels in SDMH-1, 4 & 5 were modified. Accordingly, the Companies shall change Drawing 30K-14 to show the modified formed invert channels.

Response: Drawing 30K-14 has been revised to show the modified form invert channels.

Comment 15: *Remedial Action Report, Appendix E; Drawing 30K-01C*

Field change approval dated 8/27/96 states the rim elevation of storm sewer MH-1 was raised to elevation 572.5, but the drainage structure schedule on Drawing 30K-01C shows the rim elevation of MH-1 at 573.95. The Companies shall correct this inconsistency.

Response: The elevations stated in the FCA was a proposed modification. The 573.95 feet elevation reflects as built conditions.

Comment 16: *Drawing 30K-02C*

Manhole Nos. on the Drainage Structure Schedule shall be labeled by the Companies as "SDMH", not "MH".

Response: This drawing has been changed to show "SDMH".

Comment 17: *Drawing 30K-02C*

The relocation and tie-in of the water line and gas line in the northwest corner of the Site shall be labeled by the Companies and shall reference Notes 1 & 4. Likewise, the gas tie-in north of SDMH-9 shall reference Notes 1 & 4.

Response: This drawing has been revised to show the labels of the relocation and tie-ins of the gas and water lines, and references Notes 1 and 4.

Comment 18: *Drawing 30K-04C*

The tie-in of the water line northeast of the Site shall be labeled by the Companies and Shall reference Notes 1 & 6.

Response: This drawing has been revised to show the labels of the tie-ins of the water line and references Notes 1 and 6.

Comment 19: *Drawing 30K-04C*

The existing water service connections abandon on the north side of Buffalo Avenue between SDMH-5 and SDMH-4 shall be labeled by the Companies.

Response: This drawing has been revised to show the labels of the existing water service connections abandoned between SDMH-5 and SDMH-4.

Comment 20: *Drawing 30K-04C*

The new hydrant on the north side of Buffalo Ave. located north of SDMH-4 and the new hydrant on the south side of Buffalo Ave. located east of SDMH-7 shall be labeled by the Companies.

Response: This drawing has been revised to show the labels of the new hydrants.

Comment 21: *Drawing 30K-04C*

The existing storm drain that crosses Buffalo Ave. and ties in to SDMH-4 shall be labeled by the Companies.

Response: This drawing has been revised to show the labels of the existing storm drain tie-in to SDMH-4.

Comment 22: *Drawing 30K-04C*

All the catch basin and manhole labels which reference General Note 3 shall be changed by the Companies to reference General Note 2.

Response: This drawing has been revised to show the labels for the catch basins and manholes with reference to General Note 2, not General Note 3.

Comment 23: *Drawing 30K-04C*

General Note 2 shall be changed by the Companies and shall read "Refer to Dwg. No. 594000-30K-11, 13 and 14 for storm drainage sections and details and Dwg. No. 594000-30K-01C for storm drainage structure schedule."

Response: General Note 2 has been revised.

Comment 24: *Drawing 30K-04C*

OCCIDENTAL CHEMICAL CORPORATION

OLIN CORPORATION

FINAL CLOSEOUT REPORT

100TH STREET STORM SEWER ABANDONMENT AND RELOCATION

OPERABLE UNIT 3

102nd STREET LANDFILL SITE

NIAGARA FALLS, NEW YORK

June 22, 1998

FLUOR DANIEL GTI

Marlton, New Jersey

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EXECUTIVE SUMMARY

This Final Closeout Report (COR) documents that the Occidental Chemical Corporation (OxyChem) and Olin Corporation (Olin), (the Companies) completed construction activities for the abandonment and relocation of the 42-inch 100th Street storm sewer, Operable Unit 3 (OU-3), that traversed the 102nd Street Landfill Site (Site). The Site is located in Niagara Falls, Niagara County, New York and consists of two separate properties owned by Occidental Chemical Corporation (OxyChem) and Olin Corporation (Olin), (the Companies), plus contiguous and related areas. The Site was operated as a disposal site for industrial wastes by both Companies and predecessors.

The objective of the remedial activities for OU-3, as presented in the Record of Decision (ROD) and ROD Amendment, was to abandon the existing 42-inch storm sewer in order to eliminate the transport of Site constituents of concern to the Niagara River via this pathway, and to provide a hydraulically equivalent pipeline that would be re-routed around the site. Activities at the Site were consistent with the ROD, ROD Amendment, and the remedial design (RD) for design and construction. The Remedial Action Report (RAR) contains the documentation of Quality Assurance/Quality Control (QA/QC) compliance and documentation of remedial activities.

The abandonment and relocation of the storm sewer provides assurance that transport of Site constituents of concern to the Niagara River via this pathway has been eliminated. The City of Niagara Falls will perform the Operation and Maintenance of the relocated storm sewer.

The United States Environmental Protection Agency (EPA)/New York State Department of Environmental Conservation (DEC) conducted a final inspection of the relocated storm sewer and determined that the remedy has been constructed in accordance with RD plans and specifications, and no further work is required.

1.0 INTRODUCTION

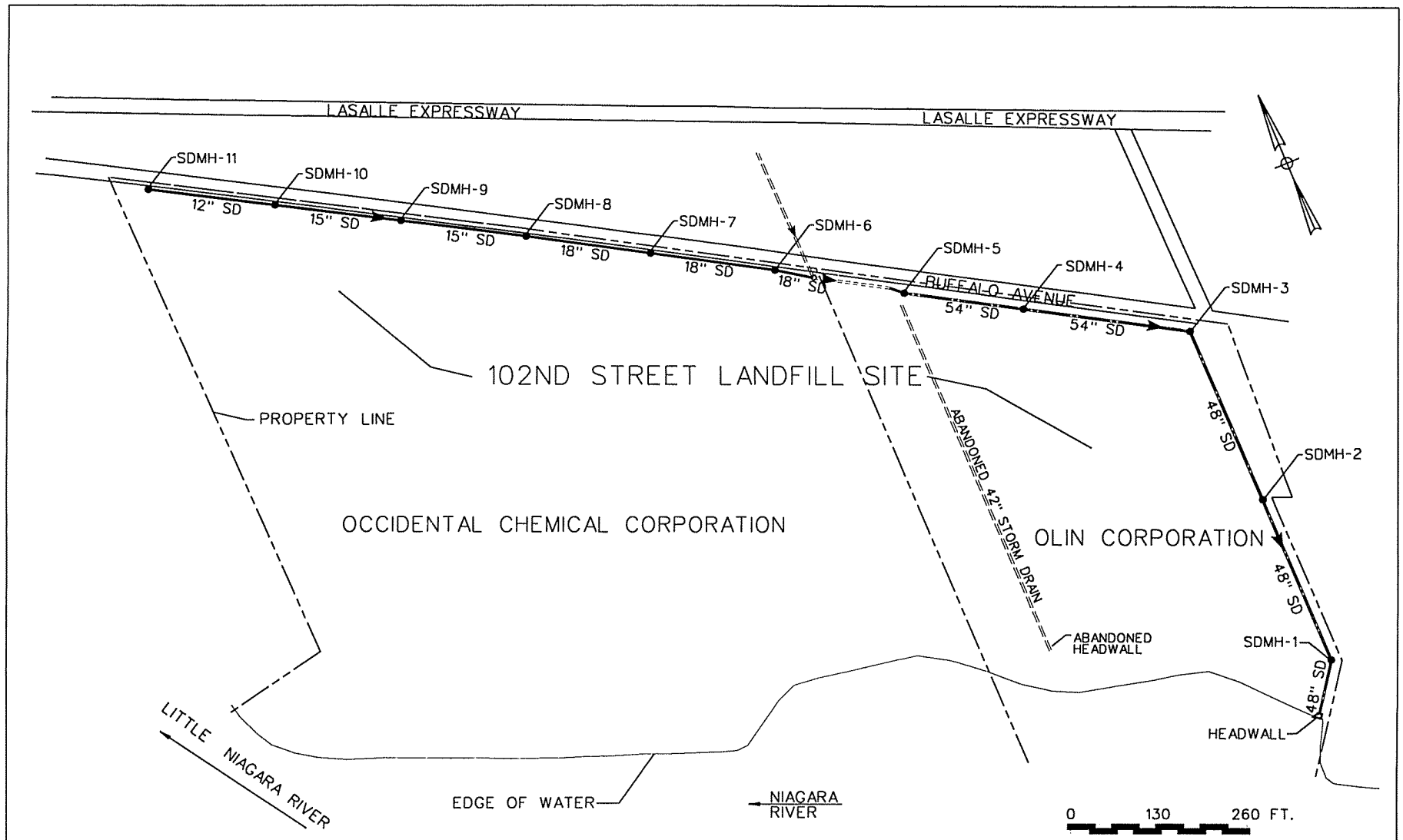
This Final Closeout Report (COR) documents that the Occidental Chemical Corporation (OxyChem) and Olin Corporation (Olin), (the Companies) completed construction activities for Operable Unit 3 (OU-3) in accordance with the U.S. Environmental Protection Agency (EPA) document Close Out Procedures for National Priorities List Sites, dated August 1995 (OSWER Dir. 9320.2-09) and Procedures for Completion and Deletion of National Priorities List Sites and Update (OSWER Directive 9320.2-3C). Operable Unit 3 consists of the Abandonment and Relocation of the 100th Street Storm Sewer at the 102nd Street Landfill Site (Site).

The United States Environmental Protection Agency (EPA)/New York State Department of Environmental Conservation (DEC) conducted a final inspection of the relocated storm sewer on October 29, 1996, and determined that the contractors have constructed the remedy in accordance with remedial design (RD) plans and specifications, and no further work is required.

2.0 SUMMARY OF SITE CONDITIONS

The Site covers approximately 22.1 acres and is located in Niagara Falls, Niagara County, New York. It consists of two separate properties owned, respectively, by OxyChem and Olin plus contiguous and related areas as defined in the September 26, 1990 Record of Decision (ROD) as amended on June 9, 1995. The Companies' properties are bordered on the south by the Niagara River, on the north by Buffalo Avenue, on the west by Griffon Park, and on the east by privately owned lands including the Belden site. The Site, as defined in the ROD for the purpose of the overall remediation, also includes the areas immediately adjacent to the northeast and to the west, the adjoining river sediments, as well as closely proximate areas necessary to carry out the remediation. The 100th Street storm sewer outfall, owned by the City of Niagara Falls, traverses the Site.

The former 42-inch diameter reinforced concrete pipe (RCP) storm sewer that traversed the landfill entered the Site from the north and discharged to the Niagara River via a headwall at the south edge of the Site (See Figure 1). The former storm sewer was abandoned in-place and a new storm sewer installed along the perimeter of the Site. Construction of the new storm sewer began along the river at the southeast corner of the Site where a headwall and flap gate were installed. From the headwall, a 48-inch high density polyethylene (HDPE) pipe was installed approximately 580 feet along the eastern property line to the northeast corner of the Site. Precast concrete storm drain manholes SDMH-1, SDMH-2, and SDMH-3 were installed at various intervals along this line. From SDMH-3, at the northeast corner of the site, 54-inch RCP was routed westward approximately 460 feet along Buffalo Avenue until being connected with the existing 42-inch RCP. Storm drain manholes SDMH-4 and SDMH-5 were installed at various locations within this interval. The existing 42-inch RCP ran westward from this junction to existing manhole MH-3. Additional storm drain was installed westward along the south side of Buffalo Avenue from existing manhole MH-3 to the northwest corner of the Site. New 18-inch RCP was installed from existing manhole MH-3 westward to SDMH-8. Storm drain manholes SDMH-6 and SDMH-7 were installed at locations within this interval. New 15-inch RCP was installed westward from SDMH-8 to SDMH-10. Storm drain manhole SDMH-9 was installed within this interval. New storm drain manhole SDMH-11 was



LEGEND

SDMH-11 STORM DRAIN MANHOLE

OXYCHEM/OLIN

102ND STREET LANDFILL

FLUOR DANIEL

STORM SEWER LOCATION PLAN

DATE: 3-12-98

REV:

PROJECT NO.: 87594010

FIGURE 1

t:\87594010\203\210\pre1296\sewrfi Mar. 16, 1998 10:07:55

installed at the northwest corner of the site and new 12-inch RCP installed between it and storm drain manhole SDMH-10.

2.1 Background

The Site was operated as a disposal site for industrial wastes by both Companies and predecessors. OxyChem, and its predecessors, operated their 15.6-acre portion of the Site as a landfill from approximately 1943 until 1970. Olin operated their 6.5-acre portion (which occupies the eastern section of the overall Site) as a landfill from 1948 to 1970.

The Site was divided into three Operable Units (OU) for investigative and remedial alternative feasibility studies. The three OUs are:

OU-1: landfill residuals, perimeter soils, shallow groundwater, and non-aqueous phase liquids;
OU-2: sediments in the Niagara River within 300 feet of the shore;
OU-3: the portion of the 100th Street Storm Sewer that crosses the site.

This report addresses OU-3 only.

The selected remedial action for the Site was presented in the ROD. The Remedial Design Work Plan (RDWP) for the Site, which describes the overall approach to the design of remedial measures, was approved by EPA on May 6, 1992. The selected remedial alternative for the storm sewer was to clean the pipe and leave it in place, line it with a chemically resistant sleeve made of high density polyethylene (HDPE) plastic, and pressure-grout the annular space between the original pipe and the sleeve.

Predesign Field Activities (PFA) were conducted at the Site between September 22 to October 27, 1992. The PFA obtained information on the soil conditions along the perimeter of the Site for the engineering design. The Predesign Field Activity Report (PFAR), which documented the PFA, was submitted to the EPA on November 20, 1992.

In 1993, the Companies requested and the EPA determined that the storm sewer be to re-routed around the site rather than lining it in place. This decision was embodied in an Explanation of Significant Differences (ESD) issued by the EPA in 1993.

These documents provided the basis for a revised remedial alternative for OU-3 as presented in the Amended ROD issued on June 9, 1995. The selected remedial alternative was relocation of the 100th Street storm sewer outfall around the perimeter of the Site.

The Final Engineering was documented in the Final Engineering Report (FER) issued September 9, 1995 and revised February 5, 1996. The FER, including drawings and technical specifications, constitutes the RD Report as defined in the Site's Administrative Order (AO) for RD and Remedial Action (RA), September 30, 1991. The RD is consistent with the selected remedy described in the Amended ROD and has taken into account and accommodated applicable or relevant and appropriate requirements (ARARS).

In support of the design of the new storm sewer, an Addendum to the PFA Geotechnical Sampling and Testing Plan (GSTP) was issued on March 25, 1994. The GSTP and its Addendum for the Storm Sewer Relocation Drilling Program provided the procedures and methods that were used for soil sample collection and testing along the new storm sewer alignment. An Addendum to the PFAR for the Storm Sewer Relocation Drilling Program was issued on September 15, 1994 and presents the results of the geotechnical sampling and testing.

2.2 Remedial Construction Activities

On March 21, 1996, the Companies formerly awarded the RA contract, thereby initiating the RA. The Companies conducted the remedial activities as planned, and no additional areas of concern were identified. The EPA/DEC and Companies conducted a final inspection on October 29, 1996 and developed a list of minor outstanding construction

items which were addressed shortly thereafter. The RA activities were performed according to design specifications set forth in the 1996 RD.

3.0 DEMONSTRATION OF CONSTRUCTION ACTIVITY QUALITY ASSURANCE/QUALITY CONTROL

Activities at the Site were consistent with the ROD, ROD Amendment, and the RD for design and construction. The RD, including the Quality Assurance Project Plan (QAPP), incorporated the quality assurance and quality control (QA/QC) procedures and protocol. The Remedial Action Report (RAR) contains the documentation of QA/QC compliance and documentation of remedial activities (Attachment).

4.0 MONITORING RESULTS

Remedial activities for OU-3 were conducted in an area not impacted by constituents of concern, thus monitoring is not necessary.

5.0 SUMMARY OF OPERATION AND MAINTENANCE

The remedy of OU-3 was completed outside the area of the 102nd Street Landfill. Therefore OU-3 is not included in the Operation and Maintenance (O&M) Plan that will be prepared for the Landfill. The storm sewer will be dedicated to the City of Niagara Falls. O&M will be conducted by the City of Niagara Falls and will consist of general inspections and repairs as needed or as scheduled by the City.

6.0 PROTECTIVENESS

This Unit (OU-3) meets the completion requirements as specified in OSWER Directive 9320.2-3C, Procedures for Completion and Deletion of National Priorities List Sites and Update. The RAR verifies that the unit has achieved the objectives of the ROD and ROD Amendment . The abandonment and relocation of the storm sewer provides assurance that transport of Site constituents of concern to the Niagara River via this pathway has been eliminated. The City of Niagara Falls will perform the Operation and Maintenance of the relocated storm sewer. A bibliography of all reports relevant to the completion of this unit is attached.

7.0 FIVE YEAR REVIEW

Because there are no hazardous substances at the unit above health-based levels, there is no need for a five-year review.

8.0 BIBLIOGRAPHY

7/90 Remedial Investigation Final Report, Vol. 1 & 2 and the Feasibility Study Final Report, Vol. 1 & 2.

9/26/90 EPA ROD.

9/30/91 EPA Administrative Order (AO) for Remedial Design and Remedial Action, Index No. II CERCLA-10223.

5/6/92 Remedial Design Work Plan (RDWP).

11/20/92 Predesign Field Activities Report (PFAR).

3/3/93 Feasibility Review of Remedial Approach for 42-inch Storm Sewer including hydraulic analysis of existing Storm Sewer.

3/25/94 The PFA GSTP Addendum for the Storm Sewer Relocation Drilling Program.

8/94 Supplemental Offshore Boring Program Addendum to the PFAR.

9/94 Storm Sewer Relocation Drilling Program Addendum to the PFAR.

6/9/95 EPA ROD Amendment.

6/30/95 RAWP for the Perimeter Soils.

7/24/95 Remedial Action SATP for the Perimeter Soils.

9/9/95 Remedial Design Package including the Engineering Report and Construction Management Plan.

11/95 Remedial Program for Perimeter Soils Verification Data Summary Report.

2/5/96 Remedial Design Package including the Engineering Report and Construction Management Plan revised.

5/10/96 Final Excavation Plan.

ATTACHMENT

REMEDIAL ACTION REPORT
FOR
100TH STREET STORM SEWER ABANDONMENT
AND RELOCATION

OCCIDENTAL CHEMICAL CORPORATION

OLIN CORPORATION

REMEDIAL ACTION REPORT

100TH STREET STORM SEWER ABANDONMENT AND RELOCATION

OPERABLE UNIT 3

102nd STREET LANDFILL SITE

NIAGARA FALLS, NEW YORK

June 22, 1998

FLUOR DANIEL GTI

Marlton, New Jersey

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594000-30K-02C	6	SITE REMEDIATION PLAN AREA 1: STORM DRAINAGE
594000-30K-04C	7	SITE REMEDIATION PLAN AREA 3: STORM DRAINAGE
594000-30K-05C	8	SITE REMEDIATION PLAN AREA 4: STORM DRAINAGE
594000-30K-11	7	UTILITY RELOCATION SECTIONS AND DETAILS
594000-30K-13	8	STORM DRAINAGE: SECTIONS AND DETAILS
594000-30K-14	6	STORM DRAINAGE: SECTIONS AND DETAILS

EXECUTIVE SUMMARY

This Remedial Action Report (RAR) documents the execution of the Remedial Action Program for the abandonment and relocation of the 42-inch 100th Street storm sewer, Operable Unit 3 (OU-3), that traversed the 102nd Street Landfill Site (Site). The Site is located in Niagara Falls, Niagara County, New York and consists of two separate properties owned by Occidental Chemical Corporation (OxyChem) and Olin Corporation (Olin), (the Companies), plus contiguous and related areas. The Site was operated as a disposal site for industrial wastes by both Companies and predecessors. Oversight for the remedial action was provided by the United States Environmental Protection Agency (EPA) and the State of New York (State).

The purpose of the Remedial Action Program for OU-3 was to prevent Site ground water from infiltrating the 42-inch storm sewer, to remove the potential for NAPL to infiltrate the storm sewer, and to eliminate the transport of constituents of concern to the Niagara River via this pathway.

The objective of the remedial activities for OU-3, as presented in the ROD and ROD Addendum, was to abandon the existing 42-inch storm sewer, and to provide a hydraulically equivalent pipeline that would be re-routed around the Site.

The Remedial Action Program for OU-3 was conducted between July 9, 1996 and October 4, 1996 and included installation of the storm sewer and appurtenances and storm sewer abandonment.

The 42-inch diameter reinforced concrete pipe (RCP) storm sewer that traversed the landfill entered the Site from the north, and discharged to the Niagara River via a headwall at the south edge of the Site. A new 54-inch RCP storm sewer was routed along the south right-of-way of Buffalo Avenue from where the existing storm sewer entered the site to a point at the northeast corner of the Site. From the northeast corner, a 48-inch HDPE storm sewer was routed south to discharge into the Niagara River. New 18-inch, 15-inch, and 12-inch RCP storm sewer was routed along the south right-of-way of Buffalo Avenue from the point where the existing storm

sewer crossed Buffalo Avenue to a point at the northwest corner of the property. Eleven precast storm drain manholes and eight catch basins were installed.

The abandonment of the existing 42-inch storm sewer was completed by clearing debris and sediment from the north and south ends of the pipe, pouring a lean concrete plug at each end with a 2-inch pipe cast in-place and pumping lean concrete through the 2-inch pipe. The required volume of 198 cubic yards of lean concrete was pumped into the pipe and was then considered abandoned.

Inspections, sampling, and testing were conducted routinely in accordance with the Site Construction Quality Assurance Project Plan (CQAPP) in order to document substantial conformance with the performance standards, project design, specifications and procedures. Field Change Approvals were utilized to document changes to the approved plans and specifications.

The final inspection was conducted on Tuesday, October 29, 1996 with the State/EPA representative, the Companies Representative, the Companies QA/QC oversight representative, and the construction contractors representative present. A "punch list" of items were observed and rectified according to plans and specifications.

The storm sewer will be dedicated to the City of Niagara Falls. Operation and maintenance will consist of general inspections and repairs as needed or as scheduled by the City of Niagara Falls.

The remedial activities implemented for the abandonment and relocation of the storm sewer were completed in substantial conformance with the requirements of the Remedial Design Documents, the ROD, ROD Addendum, and the Administrative Order.

1.0 INTRODUCTION

This Remedial Action Report (RAR) documents the execution of the Remedial Action Program for the abandonment and relocation of the 42-inch 100th Street storm sewer that traversed the site as presented in the Final Engineering Report (FER) (Fluor Daniel, Revised: February 5, 1996). The abandonment and relocation of the storm sewer constitutes Operable Unit-3 (OU-3) at the 102nd Street Landfill Site (Site). The design and selected remedial action (RA) for OU-3 will be described in detail in this RAR.

This RAR has been prepared in accordance with the United States Environmental Protection Agency (EPA) document Close Out Procedures for National Priorities List Sites, dated August 1995 (OSWER Dir. 9320.2-09).

1.1 Site Description

The Site covers approximately 22.1 acres and is located in Niagara Falls, Niagara County, New York. It consists of two separate properties owned by Occidental Chemical Corporation (OxyChem) and Olin Corporation (Olin), (the Companies), plus contiguous and related areas as defined in the September 1990 Record of Decision (ROD) as amended on June 9, 1995. The Companies property is bordered on the south by the Niagara River, on the north by Buffalo Avenue, on the west by Griffon Park, and on the east by privately owned land which includes the Belden site. The Site as defined for the purpose of the overall remediation also includes the areas immediately adjacent to the east, northeast, and to the west, the adjoining river sediments, as well as closely proximate areas necessary to carry out the remediation. The 100th Street storm sewer outfall, owned by the City of Niagara Falls, traversed the Site.

The existing 42-inch diameter reinforced concrete pipe (RCP) storm sewer entered the Site from the north, approximately 10 feet southwest of storm drain manhole (SDMH) -5, and discharged to the Niagara River via a headwall at the south edge of the Site (See Drawing No. 594000-30K-01C). The existing 42-inch storm sewer was abandoned in-

place by filling and plugging it with lean concrete.

Construction of the new storm sewer began along the river at the southeast corner of the Site where a headwall and flap gate were installed. From the headwall, a 48-inch high density polyethylene (HDPE) pipe was installed approximately 680 feet along the eastern property line to the northeast corner of the Site. Precast concrete storm drain manholes SDMH-1, SDMH-2, and SDMH-3 were installed at various intervals along this line. From SDMH-3, at the northeast corner of the site, 54-inch RCP was routed westward approximately 460 feet along Buffalo Avenue until being connected with the existing 42-inch RCP. Storm drain manholes SDMH-4 and SDMH-5 were installed at various locations within this interval. The existing 42-inch RCP ran westward from this junction to existing manhole MH-3. Additional storm drain was installed westward along the south side of Buffalo Avenue from existing manhole MH-3 to the northwest corner of the Site. New 18-inch RCP was installed from existing manhole MH-3 westward to SDMH-8. Storm drain manholes SDMH-6 and SDMH-7 were installed at locations within this interval. New 15-inch RCP was installed westward from SDMH-8 to SDMH-10. Storm drain manhole SDMH-9 was installed within this interval. New storm drain manhole SDMH-11 was installed at the northwest corner of the site and new 12-inch RCP installed between it and storm drain manhole SDMH-10.

1.2 Background

The Site was operated as a disposal site for industrial wastes by both Companies and predecessors. OxyChem, and its predecessors, operated their 15.6-acre portion of the Site as a landfill from approximately 1943 until 1970. Olin, operated their 6.5-acre portion (which occupies the eastern section of the overall Site) as a landfill from 1948 to 1970.

The Site was divided into three Operable Units (OU) for investigative and remedial alternative feasibility studies. The three OUs are:

OU-1: landfill residuals, perimeter soils, shallow groundwater, and non-aqueous

phase liquids;

OU-2: sediments in the Niagara River within 300 feet of the shore;

OU-3: the portion of the 100th Street Storm Sewer that crosses the site.

This report describes the remedy of OU-3 only.

The selected remedial action for the Site was presented in the ROD issued on September 26, 1990. The Remedial Design Work Plan (RDWP) for the Site, which describes the overall approach to the design of remedial measures, was approved by EPA on May 6, 1992. The selected remedial alternative for the storm sewer was to clean the pipe and leave it in place, line it with a chemically resistant sleeve made of high density polyethylene (HDPE) plastic, and pressure-grout the annular space between the original pipe and the sleeve.

Predesign Field Activities (PFA) were conducted at the Site between September 22 to October 27, 1992. The PFA obtained information on the soil conditions along the perimeter of the Site for the engineering design. The Predesign Field Activity Report (PFAR), which documented the PFA, was submitted to the EPA on November 20, 1992.

In 1993, the Companies decided and the EPA agreed to re-route the storm sewer around the site rather than lining it in place. This decision was embodied in an Explanation of Significant Differences (ESD) issued by the EPA in 1993.

A boring program was completed in August 1994 along the proposed alignment for relocation of the 100th Street Storm Sewer. In support of the design of the new storm sewer, an Addendum to the PFA Geotechnical Sampling and Testing Plan (GSTP) was issued on March 25, 1994. The GSTP and GSTP Addendum for the Storm Sewer Relocation Drilling Program provided the procedures and methods that were used for soil sample collection and testing along the new storm sewer alignment. The results of the program were documented in the Storm Sewer Relocation Drilling Program Addendum to the PFAR issued on September 15, 1994.

This document provided the basis for a revised remedial alternative for OU-3 as presented in the Amended ROD issued on June 9, 1995. The selected remedial alternative was the relocation of the 100th Street storm sewer outfall around the perimeter of the Site.
The Final Engineering (FER), which incorporated and accommodated comments by the City of Niagara Falls, was documented in the FER issued September 9, 1995 and revised February 5, 1996. The FER, including drawings and technical specifications, constitutes the Remedial Design (RD) Report as defined in the Site's Administrative Order (AO) for Remedial Design and Remedial Action, September 30, 1991. The Remedial Design is consistent with the selected remedy described in the Amended ROD and has taken into account and accommodated applicable or relevant and appropriate requirements (ARARS).

1.3 Purpose/Scope of Work

The purpose of the remedial program for OU-3 was to prevent Site ground water from infiltrating the 42-inch RCP storm sewer, to remove the potential for NAPL to infiltrate the 42-inch RCP storm sewer, and to eliminate the transport of constituents of concern to the Niagara River via this pathway. The remedial action program for the storm sewer relocation included the following activities:

- clearing and grubbing,
- fencing/delineation of Work Zone,
- excavation/trenching
- traffic controls,
- stormwater/groundwater management,
- erosion and sediment control,
- survey for line, grade and elevation control,
- removal of select existing storm drain and manhole,
- installation of storm drain and appurtenances,
- load, hauling and placement of excavated soils under the landfill cap,

- pressure lean concrete and plug existing storm sewer,
- backfill and restoration of excavated areas.

This RAR documents the remedial activities that took place at OU-3 as specified in the Record of Decision (ROD).

2.0 CHRONOLOGY OF EVENTS

7/90	Remedial Investigation Final Report, Vol. 1 & 2 and the Feasibility Study Final Report, Vol. 1 & 2 were accepted by EPA Region II & State of New York.
9/26/90	EPA's Region II Administrator signed the ROD which included the installation and pressure grouting of an HDPE slipliner in the existing storm sewer as appropriate remedial action for OU-3.
9/30/91	EPA's Region II Assistant Regional Counsel signed the Administrative Order (AO) for Remedial Design and Remedial Action, Index No. II CERCLA-10223.
5/6/92	Remedial Design Work Plan (RDWP) issued.
9/22/92-10/27/92	Predesign field activities (PFA) took place.
11/20/92	Predesign Field Activities Report (PFAR) issued.
3/3/93	Feasibility Review of Remedial Approach for 42-inch Storm Sewer including hydraulic analysis of existing Storm Sewer submitted.
3/25/94	The PFA GSTP Addendum for the Storm Sewer Relocation Drilling Program issued.
8/94	Storm Sewer Relocation Drilling Program was completed to determine subsurface characteristics along the proposed alignment.
9/94	Storm Sewer Relocation Drilling Program Addendum to the PFAR issued.

6/9/95	EPA's Region II Administrator signed the ROD Amendment which includes the in-place abandonment of the existing storm sewer instead of sliplining it in place, and re-routing of the storm sewer around the Site to the east.
9/9/95	Remedial Design Package including the Engineering Report and Construction Management Plan issued.
10/03/95	City of Niagara Falls approved the Storm Sewer Relocation Design Plans and Specifications.
11/07/95	EPA's Region II Chief approved the Storm Sewer Relocation Design Plans and Specifications.
2/5/96	Remedial Design Package including the Engineering Report and Construction Management Plan revised and issued.
3/21/96	Remedial Action Contract Awarded.
4/96	Site mobilization.
5/10/96	Final Excavation Plan issued.
5/96	Erosion and Sediment Control began.
7/9/96	Storm Sewer Excavation/Trenching and Installation began.
9/16/96	Existing Storm Sewer Abandonment Began.
9/20/96	Storm Sewer Excavation/Trenching and Installation complete.
10/4/96	Existing Storm Sewer Abandonment complete.

3.0 PERFORMANCE STANDARDS AND CONSTRUCTION QUALITY CONTROL

The objective of the remedial activities for OU-3, as presented in the ROD and ROD Addendum, was to abandon the existing 42-inch storm sewer in order to eliminate the transport of Site constituents of concern to the Niagara River via this pathway, and to provide a hydraulically equivalent pipeline that would be re-routed around the Site. The performance standard, or the design basis/criteria for the new storm sewer is that it be able to accommodate a 2-year, 24-hour storm event. The FER presents the design drawings and specifications for the new storm sewer construction and for the abandonment of the existing storm sewer. The following is a list of specifications that pertain to the storm sewer abandonment and relocation:

Specification 02200 - Earthwork
Specification 02725 - Underground Piping Systems
Specification 03300 - Cast-In-Place Concrete
Specification 03400 - Precast Concrete

This section provides a discussion on how the quality control (QC) objectives were met.

The EPA/State on-site representative and the Companies quality assurance representative provided oversite of the construction activities throughout the execution of the remedial action program. Inspections, sampling, and testing were conducted routinely in accordance with the Site Construction Quality Assurance Project Plan (CQAPP) in order to maintain compliance with the performance standards, project design, specifications and procedures. Inspections of construction equipment, materials, and site conditions and structures were performed and documented in specification checklists, non-conformance reports, quality control inspection reports, and daily and monthly summary reports.

Geotechnical and analytical tests were conducted on samples of the backfill material prior to placement at the Site. A summary of the test results are presented in Tables 1 and 2,

respectively. Laboratory reports for the backfill material geotechnical results are presented in Appendix A. A Laboratory Data Validation Report for the backfill material analytical results is presented in Appendix B.

In-situ backfill density (compaction) and moisture tests were performed during backfilling operations in order to verify that the specified backfill requirements were met. The results of the compaction tests are presented in Appendix C. Concrete placement and field testing reports, compression test results, and batch delivery tickets are provided in Appendix D. The requirements of the remedial design specifications and drawings were met. Field Change Approvals, which document changes to the approved plans and specifications, are included in Appendix E.

4.0 CONSTRUCTION ACTIVITIES

The Remedial Action Program for OU-3 was conducted between July 9, 1996 and October 4, 1996 and included installation of the storm sewer and appurtenances and storm sewer abandonment. Field activities were monitored by the EPA/State oversight representative and the Companies QA/QC representative.

4.1 Preconstruction Activities

The following activities were completed prior to commencing field work:

- Construction access agreements for properties adjoining the new storm sewer route were obtained.
- A pre-construction survey of the new storm sewer route was performed in April 1996.
- City of Niagara Falls permit for closure of Buffalo Avenue and re-routing of traffic was obtained in June, 1996. Inquiries were made to the New York State Department of Transportation (NYSDOT) for obtaining a Highway Work Permit, but NYSDOT did not require a Permit to be issued.

4.2 Fencing/Demarcation of Work Zone

The chain link fencing, removed prior to the excavation activities, was replaced with new temporary chain link fencing. The temporary fencing along the north side of the property was placed along the edge of Buffalo Avenue to facilitate operations for the Storm Sewer relocation. Buffalo Avenue was closed and traffic was re-routed onto Frontier Avenue according to the permit issued by the City of Niagara Falls. A permanent fence was installed on top of the retaining wall in 1997.

4.3 Equipment Cleaning

Trucks and excavation equipment were inspected for cleanliness upon mobilization to the Site and found to be acceptable. At the completion of excavation activities the excavation equipment was cleaned with a pressure washer.

4.4 Storm Sewer Excavation/Installation/Abandonment

Excavation began July 9, 1996 at the SDMH-1 location and proceeded north toward Buffalo Avenue and south toward the river. The soil was excavated and temporarily staged for potential use as backfill. If the soil did not pass the backfill criteria, it was transported and placed on the landfill.

The 48-inch HDPE pipe and precast concrete storm drain manholes SDMH-1, SDMH-2, and SDMH-3 were installed from the river to the northeast corner of the Site. Use of precast concrete manholes as opposed to cast-in-place manholes was a field change documented in the Field Change Approval (FCA) included in Appendix E, and "As Built" drawings. A precast concrete manhole was also used in place of the prefabricated HDPE manhole as originally designed for SDMH-2. The "As Built" drawings also present the actual location of SDMH-3 which was placed 5.36 feet from the design location. From SDMH-3, 54-inch RCP and SDMH-4 and SDMH-5 were installed along Buffalo Avenue westward approximately 460 feet. SDMH-5 was also installed at a location differing from the design, approximately 20 feet southeast of existing MH-2 (See Drawing No. 594000-30K-04C).

Existing MH-2, along with an approximately 30 foot long section of the existing 42-inch RCP storm sewer located west of MH-2, was removed, crushed, and placed on the landfill. The 30 foot long section of RCP was removed due to the unacceptable condition of the pipe joints for re-use as documented in the FCA (Appendix E). The 30 foot section was replaced with new 42-inch RCP. In addition, an approximately 20 foot long section of new 42-inch RCP was installed between existing MH-2 and SDMH-5. Also, an

approximately 15 foot section of existing 42-inch RCP that traversed the Site in a southerly direction from existing MH-2 was removed to facilitate installation of the slurry wall, and was crushed, and placed on the landfill.

New storm drain manholes, SDMH-6 through SDMH-11, and corresponding catch basins (CB) CB-1 through CB-6, respectively, were installed westward along Buffalo Avenue. Installation of new 18-inch RCP began at the location of existing MH-3 and continued west along Buffalo Avenue until reaching SDMH-8. New 15-inch RCP was installed between SDMH-8 and SDMH-10 and new 12-inch RCP was installed between SDMH-10 and SDMH-11.

Two additional catch basins were installed along Buffalo Avenue. CB-7 between SDMH-3 and SDMH-4 which drains into SDMH-4, and CB-8 with associated under-drain, between SDMH-6 and SDMH- 5 which drains into SDMH-5. The installation of CB-7 is a field change prompted by a change in the swale along the shoulder of Buffalo Avenue. This change in the swale is documented with an FCA found in Appendix E. The installation of CB-8 with associated under-drain is a field change and was documented in the FCA (Appendix E).

Bedding material for stable subgrade conditions included a 6-inch layer (minimum) of well graded granular gravel (#67 stone) that was placed prior to pipe installation. See detail on DWG. 594000-30K-13. Bedding material for unstable subgrade conditions included a 16 ounce non-woven geotextile fabric to line the trench and a 2 foot layer (minumum) of #3 stone placed on top of the fabric. See detail on DWG 594000-30K13. The procedure for stable subgrade conditions were followed thereafter. Following placement, the pipe was backfilled and the backfill compacted and tested as it was placed. The inverts of the manholes were formed with lean concrete to direct water from the inlet to the outlet of the manholes. An FCA was completed for the modification of the flow channel in SDMH-1, SDMH-4, and SDMH-5. A shallow invert replaced the high flow channel on the west side of SDMH-1. The height of the flow channel was changed from full height of the pipe to the spring line in SDMH-4 and SDMH-5.

Laying of pipe was completed on August 20, concrete forming of the insides of the manholes was completed on August 21, and backfilling of pipe and manholes was completed on August 26, 1996. The headwall was formed between September 11 and September 18, 1996. The new storm sewer installation required 14 concrete pours. Nine (9) sets of concrete cylinders were collected and laboratory tested for strength for QC purposes. The laboratory strength test results are included in Appendix D. One hundred twenty four compaction tests (troxler tests) of the backfill were completed on the soil, with a total of 25 failures. The failures were identified to the contractor, re-compacted and re-tested until they passed. The compaction test results are included in Appendix C.

An additional change in the original design, as documented in an FCA, was the installation of a strip drain along the base of the retaining wall to drain the landfill runoff (see Appendix E). The strip drains are designed and installed to drain to the catch basins (see "As Built" drawings).

Construction water that collected in the trench was pumped to the module tank and treated at the on-site treatment facility. The construction water was treated to within established discharge limits and discharged to the Niagara River.

The abandonment of the existing 42-inch sewer began on September 16, 1996 and was completed on October 4, 1996. The north and south ends of the pipe were cleared of debris and sediment and a lean concrete plug poured at each end. The plug at the north end of the sewer pipe had a 2-inch pipe cast in-place to allow connection to the concrete pump truck. An opening was left at the south end of the pipe to allow for visual inspection of the lean concrete as it arrived. After pumping 115 cubic yards of lean concrete into the pipe, back pressure built up. Two locations along the pipe line were excavated and observation holes cut into the pipe to determine how far the lean concrete had travelled. The first observation hole revealed recently poured lean concrete and the second observation hole revealed none. A 2-inch pipe was cast in-place at the southernmost endplug. The southernmost endplug was used to pump 83.5 cubic yards of lean concrete into the pipe for a total of 198.5 cubic yards. The second observation

hole was used to inspect for the arrival of the lean concrete. The required volume was 198 cubic yards of lean concrete was pumped into the pipe. The pipe was then considered abandoned.

4.5 Temporary Traffic Control

Buffalo Avenue was closed along the frontage of the Site and traffic was re-routed onto 102nd Street and Frontier Avenue. Reflective traffic warning signs, with top-mounted flashing lights, were placed along the edge of Buffalo Avenue and 102nd Street approaching the work area. A flagman was used to control traffic when trucks were entering and exiting Buffalo Avenue during excavation and backfilling activities.

4.6 Stormwater Management/Erosion Control

After excavation for the storm sewer relocation and prior to backfilling, construction water accumulated within some portions of the excavation. Water was removed from the excavation and transported to the module tank for treatment at the on-site facility. Silt fence was installed around the area of excavation and hale bails were placed around the drainage inlet grate for each catch basin to prevent runoff of sediment.

4.7 Placement of Excavated Soils

Excavated materials were re-used for backfill when suitable. If not suitable, the material was transported to a suitable location on the landfill and spread continuously in layers approximately 12 inches thick, and compacted. The material excavated from OxyChem's property and Olin's property was transported to their respective properties and placed under the future landfill cap. Sediment/erosion control measures are in place at the landfill as part of the work plan for operation and maintenance of the site.

4.8 Backfill/Restoration

Backfill material was obtained from the Frontier borrow source in Lockport, New York and Grand Island borrow source in Grand Island, New York. Results of the geotechnical and analytical tests conducted prior to placement of the backfill at the site are presented in Tables 1 and 2, respectively. The data reported by the analytical laboratory were QA/QC reviewed and found acceptable. The data validation report is included in Appendix B.

The backfill material was spread in layers approximately 12 inches thick and then compacted. In-situ compaction and moisture testing was performed during backfilling in order to verify that the specified backfill requirements were met. The results of the compaction testing, that substantiate compliance with the specification for compaction, are presented in Appendix C.

TABLE 1

GEOTECHNICAL TEST RESULTS
BACKFILL MATERIALS

STORM SEWER RELOCATION
102ND STREET LANDFILL SITE
NIAGARA FALLS, NEW YORK

	Grand Island	Frontier
Maximum Dry Density	117.5	114.5 pounds per cubic foot
Optimum Moisture Content	14.5	16%
USCS Soil Classification	CL	CL
Atterberg Limits:		
Liquid Limit	35	31
Plastic Limit	16	18
Plasticity Index	19	-

TABLE 2

ANALYTICAL TEST RESULTS
BACKFILL MATERIAL

STORM SEWER RELOCATION
102ND STREET LANDFILL SITE
NIAGARA FALLS, NY

Sample I.D.		CERRONE GI-01	FRONTIER 01
Sample Description		Grand Island Backfill	Frontier Backfill
Analysis Date		06/17/96	06/04/96
TAL Inorganics			
Analyte	**Units**		
Aluminum	mg/kg	11000	9400
Antimony	mg/kg	ND 5.0	ND 5.0
Arsenic	mg/kg	5.4	7.3
Barium	mg/kg	100	100
Beryllium	mg/kg	ND 0.5	ND 0.5
Cadmium	mg/kg	ND 0.5	ND 0.5
Calcium	mg/kg	160000	14000
Chromium	mg/kg	17	14
Cobalt	mg/kg	10	9.2
Copper	mg/kg	18	14
Iron	mg/kg	31000	17000
Lead	mg/kg	28	22
Manganese	mg/kg	700	1200
Magnesium	mg/kg	38000	690
Mercury	mg/kg	ND 0.5	ND 0.5
Nickel	mg/kg	18	20
Potassium	mg/kg	2700	1900
Selenium	mg/kg	ND 0.5	ND 0.5
Silver	mg/kg	ND 0.5	ND 0.5
Sodium	mg/kg	240	160
Thallium	mg/kg	6.5	ND 5.0
Vanadium	mg/kg	20	16
Zinc	mg/kg	100	46

ND 5.0 = Not Detected (Practical Quantifiable Limit)

TABLE 2 (Cont'd.)

ANALYTICAL TEST RESULTS
BACKFILL MATERIAL

STORM SEWER RELOCATION
102ND STREET LANDFILL SITE
NIAGARA FALLS, NY

Sample I.D.		CERRONE GI-01	FRONTIER 01
Sample Description		Grand Island Backfill	Frontier Backfill
Analysis Date		06/17/96	06/04/96
TCL - Volatiles, Method 8240			
Compound	**Units**		
Chloromethane	ug/kg	ND 10	ND 10
Bromomethane	ug/kg	ND 10	ND 10
Vinyl Chloride	ug/kg	ND 10	ND 10
Chloroethane	ug/kg	ND 10	ND 10
Methylene Chloride	ug/kg	ND 10	ND 10
Acetone	ug/kg	ND 10	ND 10
Carbon Disulfide	ug/kg	ND 10	ND 10
1,1-Dichloroethene	ug/kg	ND 10	ND 10
1,1-Dichloroethane	ug/kg	ND 10	ND 10
1,2-Dichloroethene (total)	ug/kg	ND 10	ND 10
Chloroform	ug/kg	ND 10	ND 10
2-Butanone	ug/kg	ND 10	ND 10
1,2-Dichloroethane	ug/kg	ND 10	ND 10
1,1,1-Trichloroethane	ug/kg	ND 10	ND 10
Carbon Tetrachloride	ug/kg	ND 10	ND 10
Vinyl Acetate	ug/kg	ND 10	ND 10
Bromodichloromethane	ug/kg	ND 10	ND 10
1,2-Dichloropropane	ug/kg	ND 10	ND 10
Cis-1,3-Dichloropropene	ug/kg	ND 10	ND 10
Trichloroethene	ug/kg	ND 10	ND 10
Benzene	ug/kg	ND 10	ND 10
Dibromochloromethane	ug/kg	ND 10	ND 10
Trans-1,3-Dichloropropene	ug/kg	ND 10	ND 10
1,1,2-Trichloroethane	ug/kg	ND 10	ND 10
Bromoform	ug/kg	ND 10	ND 10
4-Methyl-2-Pentanone	ug/kg	ND 10	ND 10
2-Hexanone	ug/kg	ND 10	ND 10
1,1,2,2-Tetrachloroethane	ug/kg	ND 10	ND 10
Tetrachloroethene	ug/kg	ND 10	ND 10
Toluene	ug/kg	ND 10	ND 10
Chlorobenzene	ug/kg	ND 10	ND 10
Ethylbenzene	ug/kg	ND 10	ND 10
Styrene	ug/kg	ND 10	ND 10

TABLE 2 (Cont'd.)

ANALYTICAL TEST RESULTS
BACKFILL MATERIAL

STORM SEWER RELOCATION
102ND STREET LANDFILL SITE
NIAGARA FALLS, NY

Sample I.D.		CERRONE GI-01	FRONTIER 01
Sample Description		Grand Island Backfill	Frontier Backfill
Analysis Date		06/17/96	06/04/96
TCL - Volatiles, Method 8240 (Cont'd.)			
Compound	**Units**		
O & P-Xylene	ug/kg	ND 10	ND 10
M-Xylene	ug/kg	ND 10	ND 10

TABLE 2 (Cont'd.)

ANALYTICAL TEST RESULTS
BACKFILL MATERIAL

STORM SEWER RELOCATION
102ND STREET LANDFILL SITE
NIAGARA FALLS, NY

Sample I.D.		CERRONE GI-01	FRONTIER 01
Sample Description		Grand Island Backfill	Frontier Backfill
Analysis Date		06/17/96	06/04/96
TCL - Semi-volatiles, Method 8270			
Compound	**Units**		
Phenol	ug/kg	ND 0.33	ND 0.33
Bis (2-Chloroethyl) ether	ug/kg	ND 0.33	ND 0.33
2-Chlorophenol	ug/kg	ND 0.33	ND 0.33
1,3-Dichlorobenzene	ug/kg	ND 0.33	ND 0.33
1,4-Dichlorobenzene	ug/kg	ND 0.33	ND 0.33
Benzyl Alcohol	ug/kg	ND 0.33	ND 0.33
1,2-Dichlorobenzene	ug/kg	ND 0.33	ND 0.33
2-Methylphenol	ug/kg	ND 0.33	ND 0.33
Bis (2-Chloroisopropyl) ether	ug/kg	ND 0.33	ND 0.33
4-Methylphenol	ug/kg	ND 0.33	ND 0.33
N-nitrosodi-n-propylamine	ug/kg	ND 0.33	ND 0.33
Hexachloroethane	ug/kg	ND 0.33	ND 0.33
Nitrobenzene	ug/kg	ND 0.33	ND 0.33
Isophorone	ug/kg	ND 0.33	ND 0.33
2-Nitrophenol	ug/kg	ND 0.33	ND 0.33
2,4-Dimethylphenol	ug/kg	ND 0.33	ND 0.33
Bis (2-Chloroethoxy) methane	ug/kg	ND 0.33	ND 0.33
Benzoic Acid	ug/kg	ND 0.33	ND 0.33
2,4-Dichlorophenol	ug/kg	ND 0.33	ND 0.33
1,2,4-Trichlorobenzene	ug/kg	ND 0.33	ND 0.33
Naphthalene	ug/kg	ND 0.33	ND 0.33
4-Chloroaniline	ug/kg	ND 0.33	ND 0.33
Hexachlorobutadiene	ug/kg	ND 0.33	ND 0.33
4-Chloro-3-Methylphenol	ug/kg	ND 0.33	ND 0.33
2-Methylnaphthalene	ug/kg	ND 0.33	ND 0.33
Hexachlorocyclopentadiene	ug/kg	ND 0.33	ND 0.33
2,4,6-Trichlorophenol	ug/kg	ND 0.33	ND 0.33
2,4,5-Trichlorophenol	ug/kg	ND 0.33	ND 0.33
2-Chloronaphthalene	ug/kg	ND 0.33	ND 0.33
2-Nitroaniline	ug/kg	ND 0.33	ND 0.33
Dimethylphthalate	ug/kg	ND 0.33	ND 0.33
Acenaphthylene	ug/kg	ND 0.33	ND 0.33
3-Nitroaniline	ug/kg	ND 0.33	ND 0.33
2,6-Dinitrotoluene	ug/kg	ND 0.33	ND 0.33
Acenaphthene	ug/kg	ND 0.33	ND 0.33

TABLE 2 (Cont'd.)

ANALYTICAL TEST RESULTS
BACKFILL MATERIAL

STORM SEWER RELOCATION
102ND STREET LANDFILL SITE
NIAGARA FALLS, NY

Sample I.D.		CERRONE GI-01	FRONTIER 01
Sample Description		Grand Island Backfill	Frontier Backfill
Analysis Date		06/17/96	06/04/96
TCL - Semi-volatiles, Method 8270 (Cont'd.)			
Compound	**Units**		
2,4-Dinitrophenol	ug/kg	ND 0.33	ND 0.33
4-Nitrophenol	ug/kg	ND 0.33	ND 0.33
Dibenzofuran	ug/kg	ND 0.33	ND 0.33
2,4-Dinitrotoluene	ug/kg	ND 0.33	ND 0.33
Diethylphthalate	ug/kg	ND 0.33	ND 0.33
Fluorene	ug/kg	ND 0.33	ND 0.33
4-Nitroaniline	ug/kg	ND 0.33	ND 0.33
4-Chlorophenylphenylether	ug/kg	ND 0.33	ND 0.33
4,6-Dinitro 2-Methylphenol	ug/kg	ND 0.33	ND 0.33
N-Nitrosodiphenylamine	ug/kg	ND 0.33	ND 0.33
4-Bromophenylphenylether	ug/kg	ND 0.33	ND 0.33
Hexachlorobenzene	ug/kg	ND 0.33	ND 0.33
Pentachlorophenol	ug/kg	ND 0.33	ND 0.33
Phenanthrene	ug/kg	ND 0.33	ND 0.33
Anthracene	ug/kg	ND 0.33	ND 0.33
Carbazole	ug/kg	ND 0.33	ND 0.33
Di-n-butylphthalate	ug/kg	ND 0.33	ND 0.33
Fluoranthene	ug/kg	ND 0.33	ND 0.33
Benzidine	ug/kg	ND 0.33	ND 0.33
Pyrene	ug/kg	ND 0.33	ND 0.33
Butylbenzylphthalate	ug/kg	ND 0.33	ND 0.33
3,3'-Dichlorobenzidine	ug/kg	ND 0.33	ND 0.33
Benzo (a) Anthracene	ug/kg	ND 0.33	ND 0.33
Chrysene	ug/kg	ND 0.33	ND 0.33
Bis (2-ethylhexyl) Phthalate	ug/Kg	ND 0.33	ND 0.33
Di-n-octylphthalate	ug/kg	ND 0.33	ND 0.33
Benzo (b) Fluoranthene	ug/kg	ND 0.33	ND 0.33
Benzo (k) Fluoranthene	ug/kg	ND 0.33	ND 0.33
Benzo (a) Pyrene	ug/kg	ND 0.33	ND 0.33
Indeno (1,2,3-cd) Pyrene	ug/kg	ND 0.33	ND 0.33
Dibenzo (a,h) Anthracene	ug/kg	ND 0.33	ND 0.33
Benzo (g,h,i) Perylene	ug/kg	ND 0.33	ND 0.33

TABLE 2 (Cont'd.)

ANALYTICAL TEST RESULTS
BACKFILL MATERIAL

STORM SEWER RELOCATION
102ND STREET LANDFILL SITE
NIAGARA FALLS, NY

Sample I.D.		CERRONE GI-01	FRONTIER 01
Sample Description		Grand Island Backfill	Frontier Backfill
Analysis Date		06/17/96	06/04/96
TCL - Pesticides			
Compound	**Units**		
Endrin	ug/kg	ND 0.002	ND 0.002
Endrin Ketone	ug/kg	ND 0.002	ND 0.002
Endrin Aldehyde	ug/kg	ND 0.002	ND 0.002
Heptachlor	ug/kg	ND 0.002	ND 0.002
Heptachlor Epoxide	ug/kg	ND 0.002	ND 0.002
Methoxychlor	ug/kg	ND 0.002	ND 0.002
Toxaphene	ug/kg	ND 0.083	ND 0.083
Aldrin	ug/kg	ND 0.002	ND 0.002
Alpha-BHC	ug/kg	ND 0.002	ND 0.002
Beta-BHC	ug/kg	ND 0.002	ND 0.002
Delta-BHC	ug/kg	ND 0.002	ND 0.002
Gamma-BHC (Lindane)	ug/kg	ND 0.002	ND 0.002
Chlordane	ug/kg	ND 0.033	ND 0.033
4,4'-DDD	ug/kg	ND 0.002	ND 0.002
4,4'-DDE	ug/kg	ND 0.002	ND 0.002
4,4'-DDT	ug/kg	ND 0.002	ND 0.002
Dieldrin	ug/kg	ND 0.002	ND 0.002
Endosulfan I	ug/kg	ND 0.002	ND 0.002
Endosulfan II	ug/kg	ND 0.002	ND 0.002
Endosulfan Sulfate	ug/kg	ND 0.002	ND 0.002
TCL - PCB, Method 8080			
Aroclor 1016	mg/kg	ND 0.033	ND 0.033
Aroclor 1221	mg/kg	ND 0.033	ND 0.033
Aroclor 1232	mg/kg	ND 0.033	ND 0.033
Aroclor 1242	mg/kg	ND 0.033	ND 0.033
Aroclor 1248	mg/kg	ND 0.033	ND 0.033
Aroclor 1254	mg/kg	ND 0.033	ND 0.033
Aroclor 1260	mg/kg	ND 0.033	ND 0.033

5.0 FINAL INSPECTION

The final inspection was conducted on Tuesday , October 29, 1996 with the DEC/EPA representative, the Companies Representative, the Companies QA/QC oversight representative, and the construction contractors representative present. The following is a "punch list" of items that were observed and addressed:

CB-5: hay and soil present inside basin have been removed,

SDMH-9: rim was knocked off center and has been moved back to center, mortar on inside of rim was broken and chipped and has been repaired,

CB-2: sealant between sections of CB was peeling/broken on SE side of CB and has been grouted,

SDMH-6: there was a half inch gap in the bricks on the western side of the riser. The mortar on the outside was chipped/broken and has been filled with grout,

SDMH-5: the manhole was buried under the access road and has been uncovered and inspected with nothing to report,

SDMH-4: outside mortar was cracked/broken and has been repaired,

SDMH-2: rim/riser was knocked off by Geocon during slurry wall construction and has been replaced,

Headwall: riprap around headwall needed to be placed and has since been installed.

The "punch list" items have been addressed and rectified according to plans and specifications.

6.0 OPERATION AND MAINTENANCE PLAN

The storm sewer will be dedicated to the City of Niagara Falls. Operation and maintenance will consist of general inspections and repairs as needed or as scheduled by the City of Niagara Falls.

7.0 VERIFICATION THAT REMEDY MEETS PERFORMANCE STANDARDS

NEW YORK STATE PROFESSIONAL ENGINEER'S CERTIFICATION for REMEDIAL ACTION REPORT, 100th STREET STORM SEWER ABANDONMENT AND RELOCATION, OPERABLE UNIT 3, 102nd STREET LANDFILL SITE, NIAGARA FALLS, NEW YORK, dated 1/30/98.

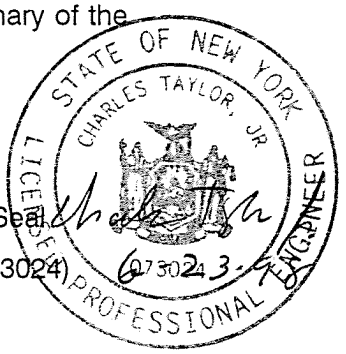
This report documents the remedial activities completed for the abandonment and relocation of the 100th Street Storm Sewer, 102nd Street Landfill Site. I certify that the remedial activities implemented for the abandonment and relocation of the storm sewer were completed in substantial conformance with the requirements of the Remedial Design Documents, the ROD, ROD Addendum, and the Administrative Order. The data presented is considered to be technically correct to the best of my knowledge. The accounts of the remedial activities executed during the abandonment and relocation of the storm sewer presented herein are a true and accurate summary of the observations made during the implementation period.

Charles Taylor, Jr 6-23-98

Signature

Seal

Charles Taylor, State of New York Professional Engineer (073024)



APPENDIX A

GEOTECHNICAL LAB REPORTS - BACKFILL MATERIAL

GEOTECHNICAL LABORATORY TESTING DATA SUMMARY

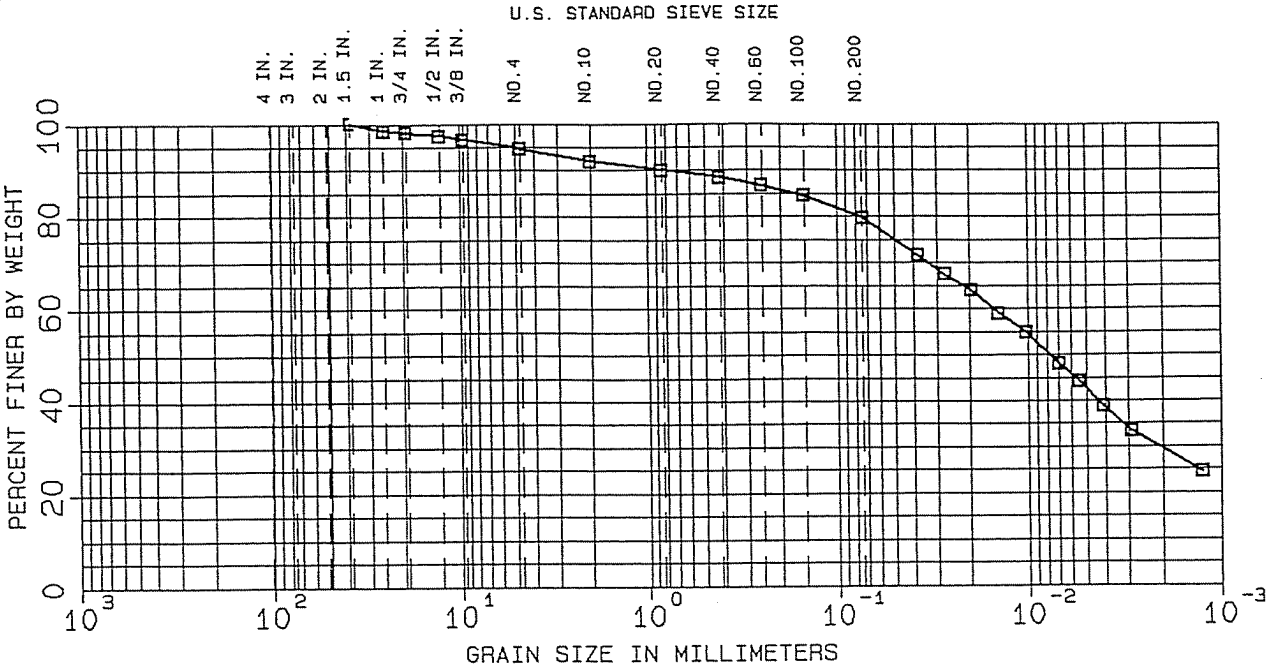
PROJECT NAME: 102ND STREET LANDFILL REMEDIATION PROJECT - NIAGARA FALLS, N.Y.
PROJECT NO. 55099.00
CLIENT: SMITH ENVIRONMENTAL TECHNOLOGIES CORP.
MATERIAL SOURCE: GRAND ISLAND SOURCE - GRAND ISLAND, N.Y.
DATE REPORTED: 8/8/96
WORK ORDER NO. 2

IDENTIFICATION			WATER CONTENT	ATTERBERG LIMITS			GRAIN SIZE ANALYSIS		MOISTURE-DENSITY RELATIONSHIP (Standard)		PERMEABILITY TEST					LABORATORY LOG AND SOIL DESCRIPTION
SAMPLE TYPE	SAMPLE NUMBER	DEPTH ft.	%	LL %	PL %	PI	SIEVE -200 %	HYD. -2μ %	MAX. DRY DENSITY pcf	OPT. WATER CONTENT %	PERME-ABILITY cm/sec.	TYPE OF TEST	$\bar{\sigma}_c$ psf	DRY UNIT WT pcf	WATER CONTENT %	
BULK	~~06126~~ 06216 1		19.3	31	16	15	80	29	121.5	13.0	2.9E-07	Kr	720	115.9	13.2	Reddish Brown Lean Clay with Sand (CL)

Notes: 1) See Legend for Geotechnical Laboratory Testing Data Summary.

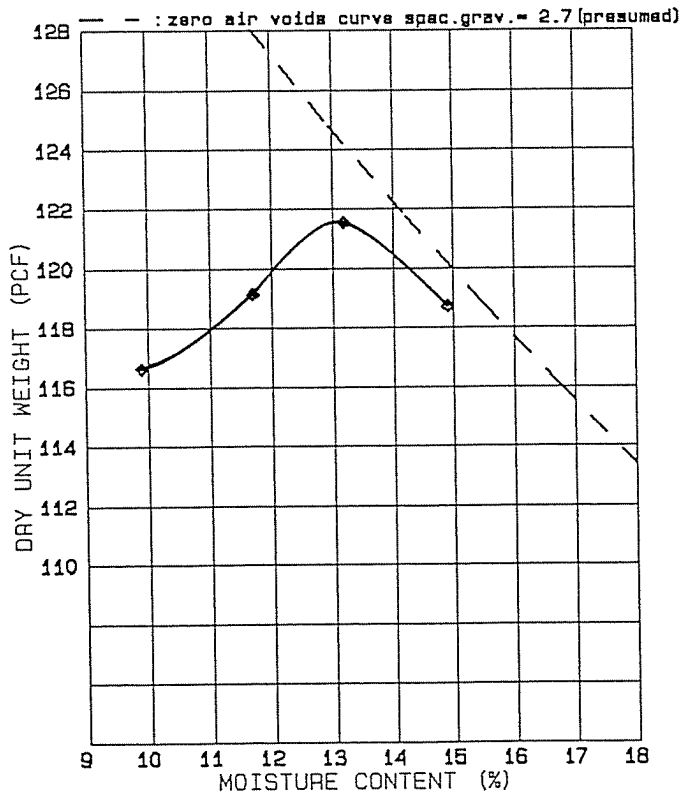
2) See Geotechnical Laboratory Test Procedures for specific test procedures completed.

PARTICLE-SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT	CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

Hydrometer sample dispersed with a mechanical stirring device, Type A, for 1 min. Dispersed sample was separated on a No. 200 sieve. Hydrometer readings obtained on fraction finer than No. 200 sieve.



MOISTURE-DENSITY RELATIONSHIP

SOIL PROPERTIES					
SOIL DESCRIPTION: Reddish Brown Lean Clay with Sand (CL)					
OPT. WATER CONTENT	13 %	MAX. DRY UNIT WT.	121.5 pcf		
LIQUID LIMIT	31 %	PLASTIC LIMIT	16 %	SPECIFIC GRAVITY	

COMPACTION METHOD			
ASTM TEST	D698-91	PROCEDURE	A
AASHTO TEST		METHOD	
MOLD HEIGHT	4.59 in.	MOLD DIA.	4 in.
NO. LAYERS	3	BLOWS/LAYER	25
HAMMER WT.	5.5 lbs.	DROP HEIGHT	12 in.
SAMPLE PREPARATION - DRY METHOD			
COMPACTED BY MECHANICAL RAMMER			

102ND STREET LANDFILL REMEDIATION
PROJECT - NIAGARA FALLS, NEW YORK

PARTICLE-SIZE ANALYSIS
MOISTURE-DENSITY RELATIONSHIP

EXPLOR. NO.	BULK SAMPLE	WORK ORDER NO.	2644
SAMPLE NO.	06216-1	DATE	7/1/96
DEPTH	STOCKPILE		
TECH.	HAK/RAR		
REVIEWER	RAR	FILE	55099.00
SOURCE	GRAND ISLAND SOURCE GRAND ISLAND, N.Y.		

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Engineers and Scientists

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102ND STREET REMEDIATION PROJECT
NIAGARA FALLS, NEW YORK

HYDRAULIC CONDUCTIVITY USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 90

GZA FILE: 55099.0 GZA WORK ORDER NO. 2644 COMPLETED: July 1, 1996

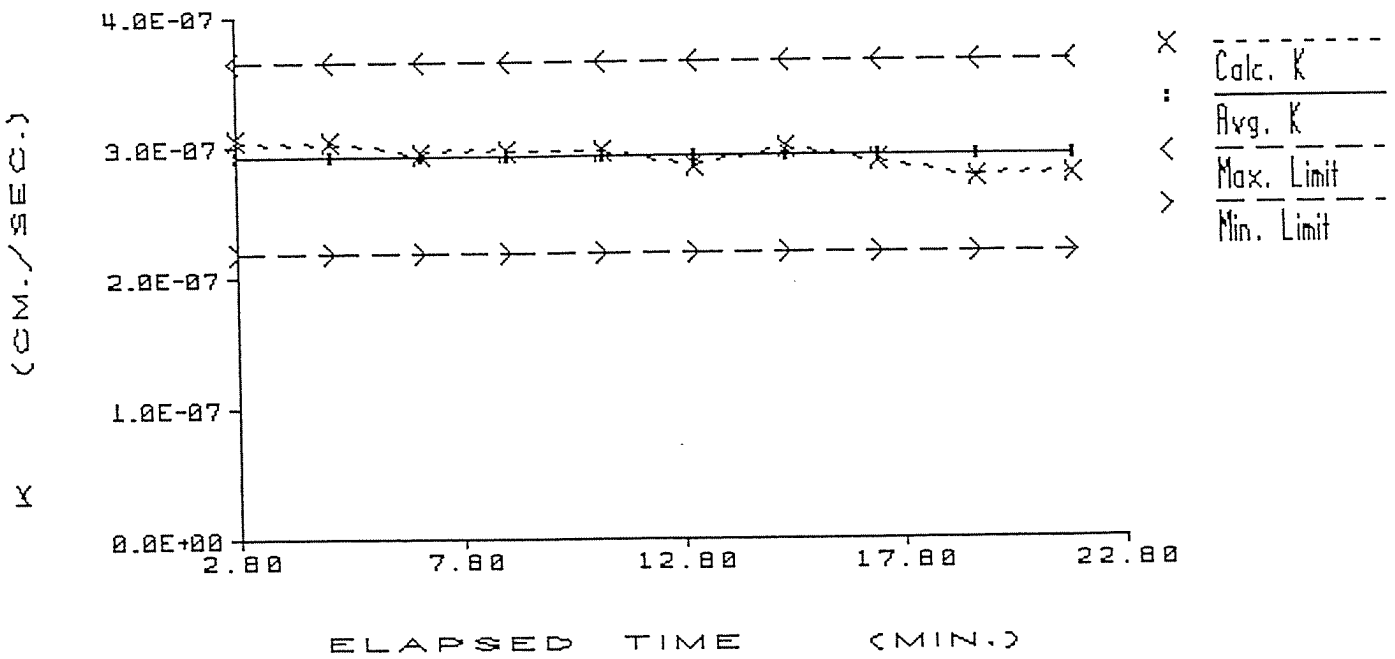
SAMPLE NUMBER:	06216-1
MATERIAL SOURCE:	GRAND ISLAND SOURCE - GRAND ISLAND, N.Y.
SAMPLE TYPE:	RECONSTITUTED USING HAND RAMMER AND 5 LIFTS
TEST SERIES NO.:	Kr9.1

SAMPLE DATA:	INITIAL	FINAL
DIAMETER (in.)	2.831	2.832
LENGTH (in.)	1.970	1.963
WATER CONTENT (%)	13.2	16.2
DRY UNIT WEIGHT (pcf.)	115.9	116.2

TEST PARAMETERS:	
TOTAL BACK PRESSURE (psi.)	80
MAXIMUM EFFECTIVE STRESS (psi.)	5
MINIMUM EFFECTIVE STRESS (psi.)	3
INITIAL HYDRAULIC GRADIENT	31
FINAL HYDRAULIC GRADIENT	30
PERMEANT LIQUID	DEAIRED TAP WATER

AVERAGE HYDRAULIC CONDUCTIVITY (cm./sec.) 2.9E-07

PERMEABILTY vs TIME



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GEOTECHNICAL LABORATORY TESTING DATA SUMMARY

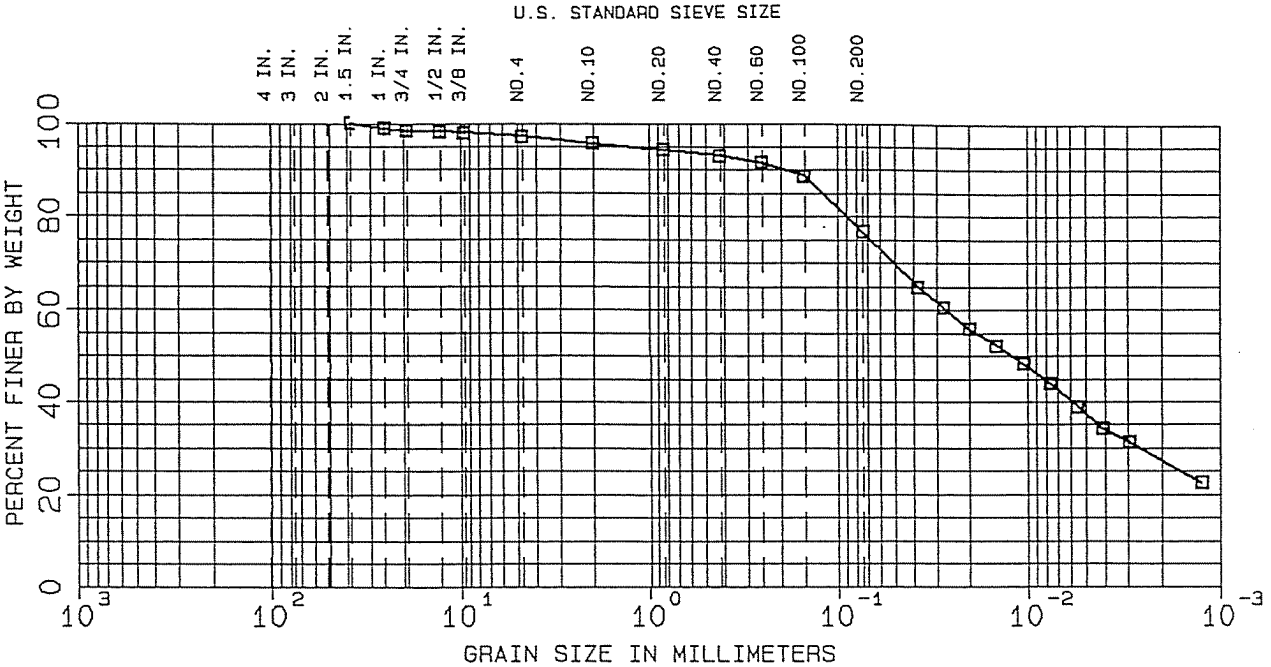
PROJECT NAME: 102ND STREET LANDFILL REMEDIATION PROJECT - NIAGARA FALLS, N.Y.
PROJECT NO. 55099.00
CLIENT: SMITH ENVIRONMENTAL TECHNOLOGIES CORP.
MATERIAL SOURCE: GRAND ISLAND SOURCE 2ND AREA - GRAND ISLAND, N.Y.
DATE REPORTED: 8/8/96
WORK ORDER NO. 2652

IDENTIFICATION			WATER CONTENT	ATTERBERG LIMITS			GRAIN SIZE ANALYSIS		MOISTURE-DENSITY RELATIONSHIP (Standard)		PERMEABILITY TEST					LABORATORY LOG AND SOIL DESCRIPTION
SAMPLE TYPE	SAMPLE NUMBER	DEPTH ft.	%	LL %	PL %	PI	SIEVE -200 %	HYD. -2μ %	MAX. DRY DENSITY pcf	OPT. WATER CONTENT %	PERME-ABILITY cm/sec.	TYPE OF TEST	$\bar{\sigma}_c$ psf	DRY UNIT WT pcf	WATER CONTENT %	
BULK	06286-1		15.5	35	16	19	77	27	117.5	14.5	1.3E-06	Kr	720	106.4	14.6	Dark Brown Lean Clay with Sand (CL)

Notes: 1) See Legend for Geotechnical Laboratory Testing Data Summary.

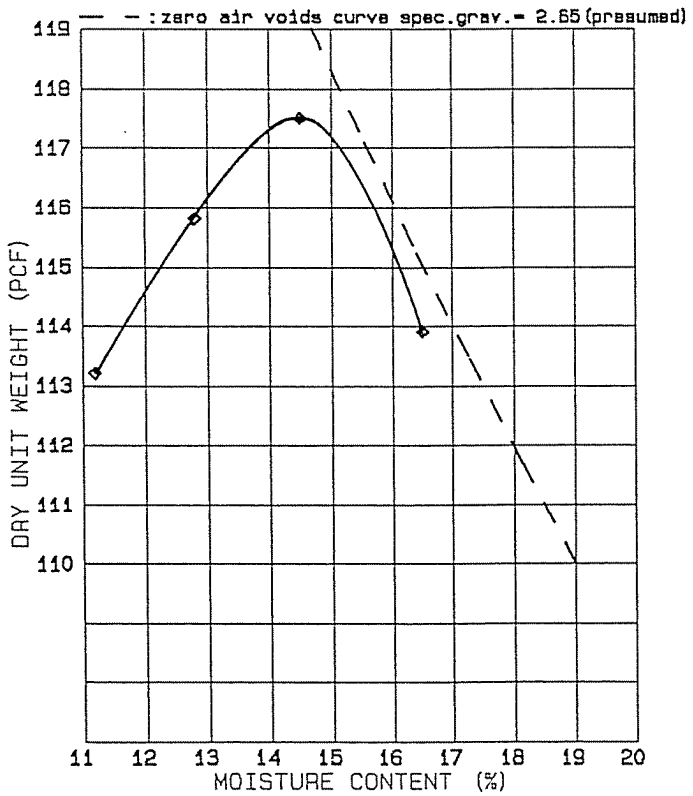
2) See Geotechnical Laboratory Test Procedures for specific test procedures completed.

PARTICLE-SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT	CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

Hydrometer sample dispersed with a mechanical stirring device, Type A, for 1 min. Dispersed sample was separated on a No. 200 sieve. Hydrometer readings obtained on fraction finer than No. 200 sieve.



MOISTURE-DENSITY RELATIONSHIP

SOIL PROPERTIES			
SOIL DESCRIPTION:	Dark Brown Lean Clay with Sand (CL)		
OPT. WATER CONTENT	14.5 %	MAX. DRY UNIT WT.	117.5 pcf
LIQUID LIMIT	35 %	PLASTIC LIMIT	16 %
		SPECIFIC GRAVITY	

COMPACTION METHOD			
ASTM TEST	D698-91	PROCEDURE	A
AASHTO TEST		METHOD	
MOLD HEIGHT	4.59 in.	MOLD DIA.	4 in.
NO. LAYERS	3	BLOWS/LAYER	25
HAMMER WT.	5.5 lbs.	DROP HEIGHT	12 in.
SAMPLE PREPARATION - DRY METHOD			
COMPACTED BY MECHANICAL RAMMER			

102ND STREET LANDFILL REMEDIATION
PROJECT - NIAGARA FALLS, NEW YORK

PARTICLE-SIZE ANALYSIS
MOISTURE-DENSITY RELATIONSHIP

EXPLOR. NO.	BULK SAMPLE	WORK ORDER NO.	2652
SAMPLE NO.	06296-1		
DEPTH		DATE	7/25/96
TECH.	HAK		
REVIEWER	RAR	FILE	55099.00
SOURCE	GRAND ISLAND SOURCE 2ND AREA		

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102ND STREET LANDFILL REMEDIATION PROJECT
NIAGARA FALLS, NEW YORK

HYDRAULIC CONDUCTIVITY USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 90

GZA FILE: 55099.0 GZA WORK ORDER NO. 2652 COMPLETED: July 11, 1996

SAMPLE NUMBER: 06286-1
MATERIAL SOURCE: GRAND ISLAND SOURCE - 2ND AREA
SAMPLE TYPE: RECONSTITUTED USING HAND RAMMER AND 5 LIFTS
TEST SERIES NO.: Kr10.1

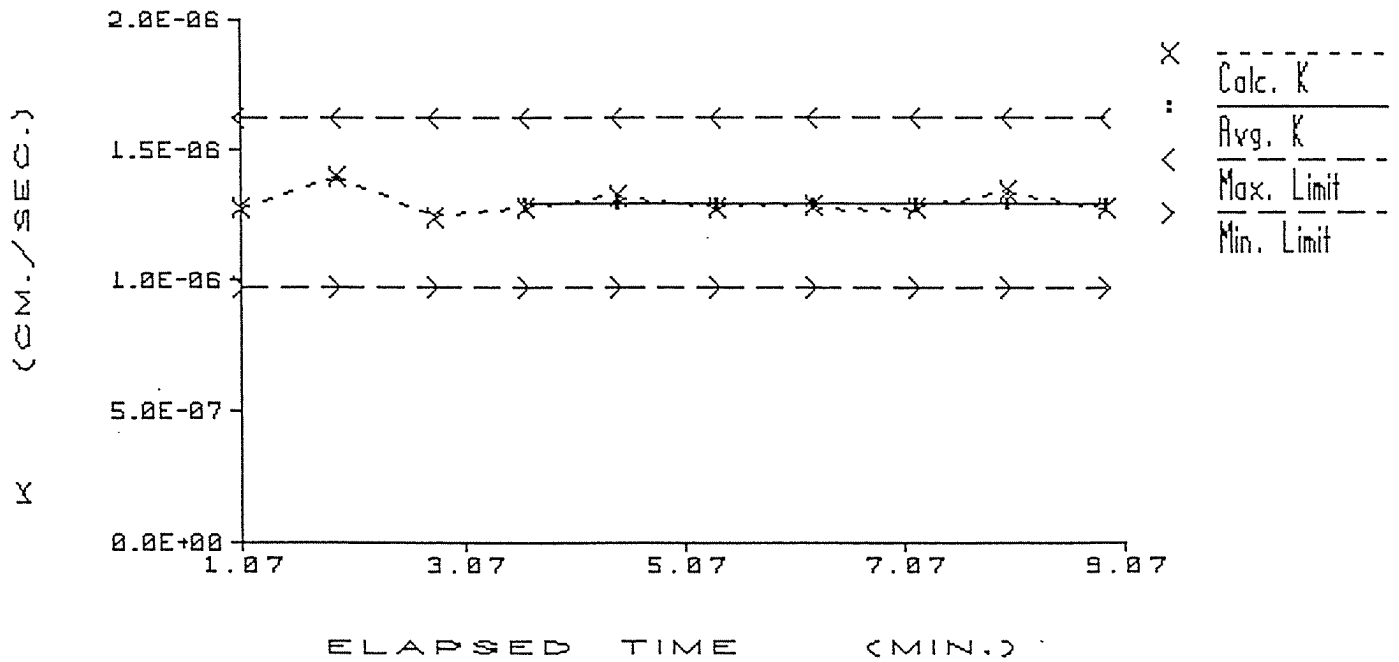
SAMPLE DATA:	INITIAL	FINAL
DIAMETER (in.)	2.830	2.835
LENGTH (in.)	1.975	1.935
WATER CONTENT (%)	14.6	19.2
DRY UNIT WEIGHT (pcf.)	106.4	108.2

TEST PARAMETERS:

TOTAL BACK PRESSURE (psi.)	80
MAXIMUM EFFECTIVE STRESS (psi.)	5
MINIMUM EFFECTIVE STRESS (psi.)	4
INITIAL HYDRAULIC GRADIENT	17
FINAL HYDRAULIC GRADIENT	16
PERMEANT LIQUID	DEAIRED TAP WATER

AVERAGE HYDRAULIC CONDUCTIVITY (cm./sec.) 1.3E-06

PERMEABILTY vs TIME



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GEOTECHNICAL LABORATORY TESTING DATA SUMMARY

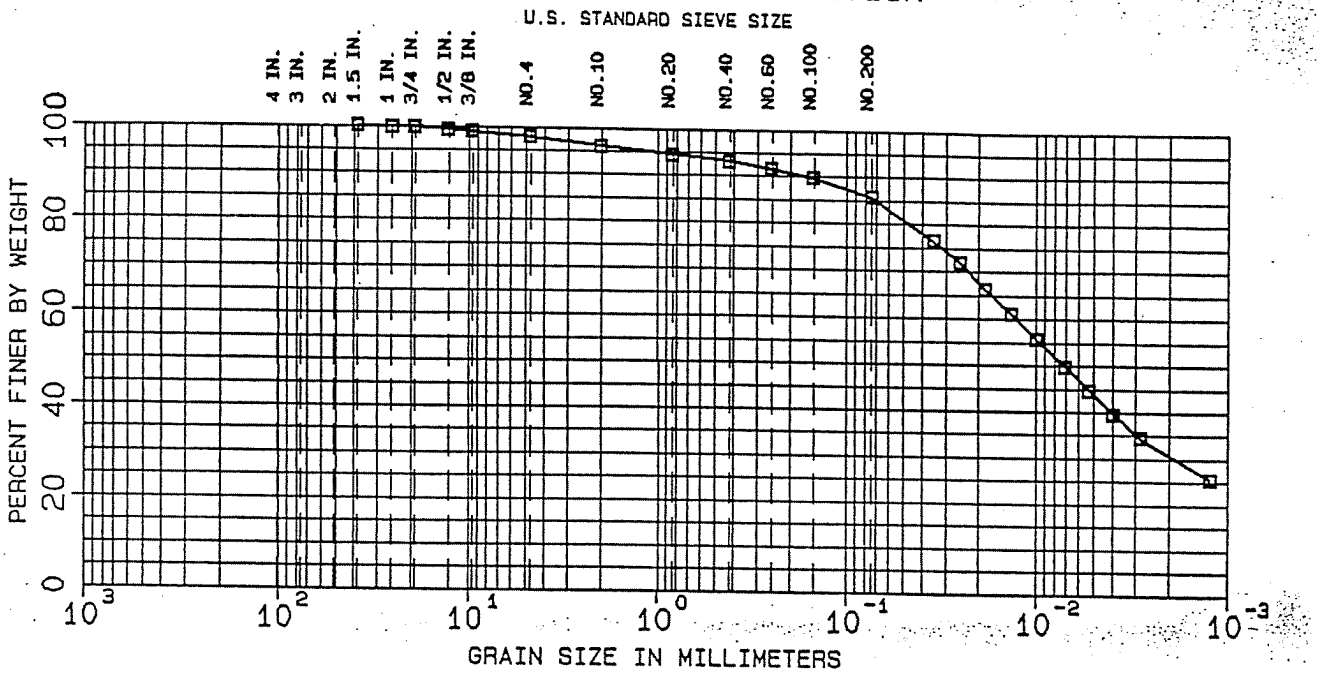
PROJECT NAME: 102ND STREET LANDFILL REMEDIATION PROJECT - NIAGARA FALLS, N.Y. MATERIAL SOURCE: VARIES
PROJECT NO. 55099.00 CLIENT: SMITH ENVIRONMENTAL TECHNOLOGIES CORP. DATE REPORTED: 6/3/96 WORK ORDER NO. 2579

IDENTIFICATION			WATER CONTENT	ATTERBERG LIMITS			GRAIN SIZE ANALYSIS		MOISTURE-DENSITY RELATIONSHIP (Standard)		PERMEABILITY TEST					LABORATORY LOG AND SOIL DESCRIPTION
SAMPLE TYPE	SAMPLE NUMBER	DEPTH ft.	%	LL %	PL %	PI	SIEVE -200 %	HYD. -2μ %	MAX. DRY DENSITY pcf	OPT. WATER CONTENT %	PERME-ABILITY cm/sec.	TYPE OF TEST	$\bar{\sigma}_c$ psf	DRY UNIT WT pcf	WATER CONTENT %	
BULK	05176-1	N. Bank -2 ft.	23.4	51	24	27	98	60	103.0	22.0	4.9E-08	Kr	720	92.7	22.1	Brownish Gray Fat Clay (CH) Source: Summit Park Borrow Pit
BULK	05176-2	S. Bank Surface	17.6	31	18	13	86	31	114.5	16.0	9.1E-08	Kr	720	103.6	16.0	Reddish Brown Lean Clay (CL) Source: Frontier Stone Quarry
BULK	05176-3	N. Bank Surface	10.2	17	14	3	52	8	128.5	9.0	4.7E-05	Kr	720	115.7	8.9	Reddish Brown Sand Silt (ML) Source: Wheeler Road Borrow Pit

Notes: 1) See Legend for Geotechnical Laboratory Testing Data Summary sheet.

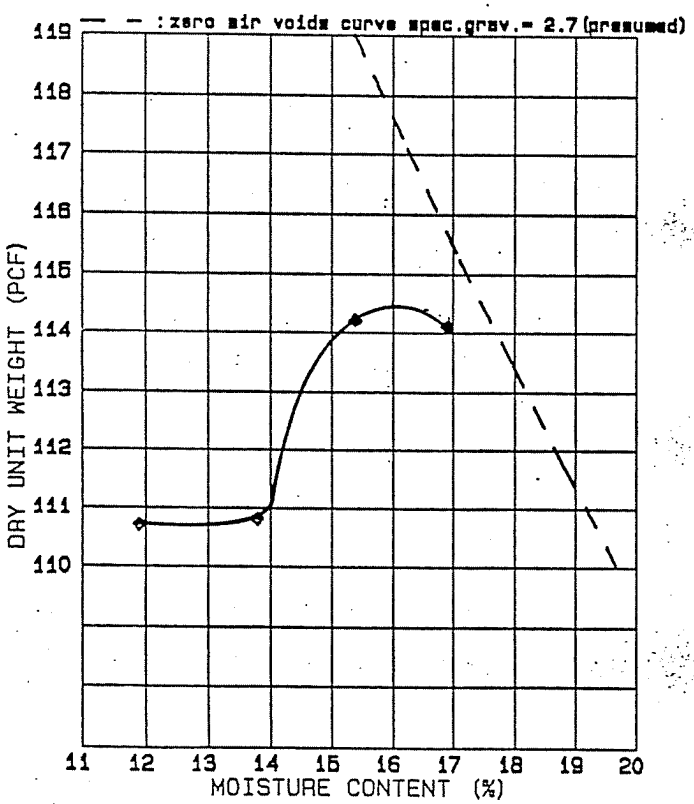
2) See Geotechnical Laboratory Test Procedures for specific test procedures completed.

PARTICLE-SIZE DISTRIBUTION



COBBLES	GRAVEL		SAND			SILT	CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

Hydrometer sample dispersed with a mechanical stirring device, Type A, for 1 min. Dispersed sample was separated on a No. 200 sieve. Hydrometer readings obtained on fraction finer than No. 200 sieve.



MOISTURE-DENSITY RELATIONSHIP

SOIL PROPERTIES					
SOIL DESCRIPTION:	Reddish Brown Lean Clay (CL)				
OPT. WATER CONTENT	16 %	MAX. DRY UNIT WT.	114.5 pcf		
LIQUID LIMIT	31 %	PLASTIC LIMIT	18 %	SPECIFIC GRAVITY	

COMPACTION METHOD			
ASTM TEST	D698-91	PROCEDURE	A
AASHTO TEST		METHOD	
MOLD HEIGHT	4.59 in.	MOLD DIA.	4 in.
NO. LAYERS	3	BLOWS/LAYER	25
HAMMER WT.	5.5 lbs.	DROP HEIGHT	12 in.
SAMPLE PREPARATION - DRY METHOD			
COMPACTED BY MECHANICAL RAMMER			

102ND STREET REMEDIATION PROJECT
NIAGARA FALLS, NEW YORK

PARTICLE-SIZE ANALYSIS
MOISTURE-DENSITY RELATIONSHIP

EXPLOR. NO.	BULK SAMPLE	WORK ORDER NO.	2579
SAMPLE NO.	05178-2	DATE	5/23/96
DEPTH	SURFACE		
TECH.	DEW		
REVIEWER	JJO	FILE	55099.00
SOURCE	FRONTIER STONE QUARRY SOUTH BANK		

102ND STREET REMEDIATION PROJECT
NIAGARA FALLS, NEW YORK

HYDRAULIC CONDUCTIVITY USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 90

GZA FILE: 55099.0 GZA WORK ORDER NO. 2579 COMPLETED: June 2, 1996

SAMPLE NUMBER: 05176-2
MATERIAL SOURCE: FRONTIER STONE - LOCKPORT, NEW YORK
SAMPLE TYPE: RECONSTITUTED USING HAND RAMMER AND 5 LIFTS
TEST SERIES NO.: Kr3.1

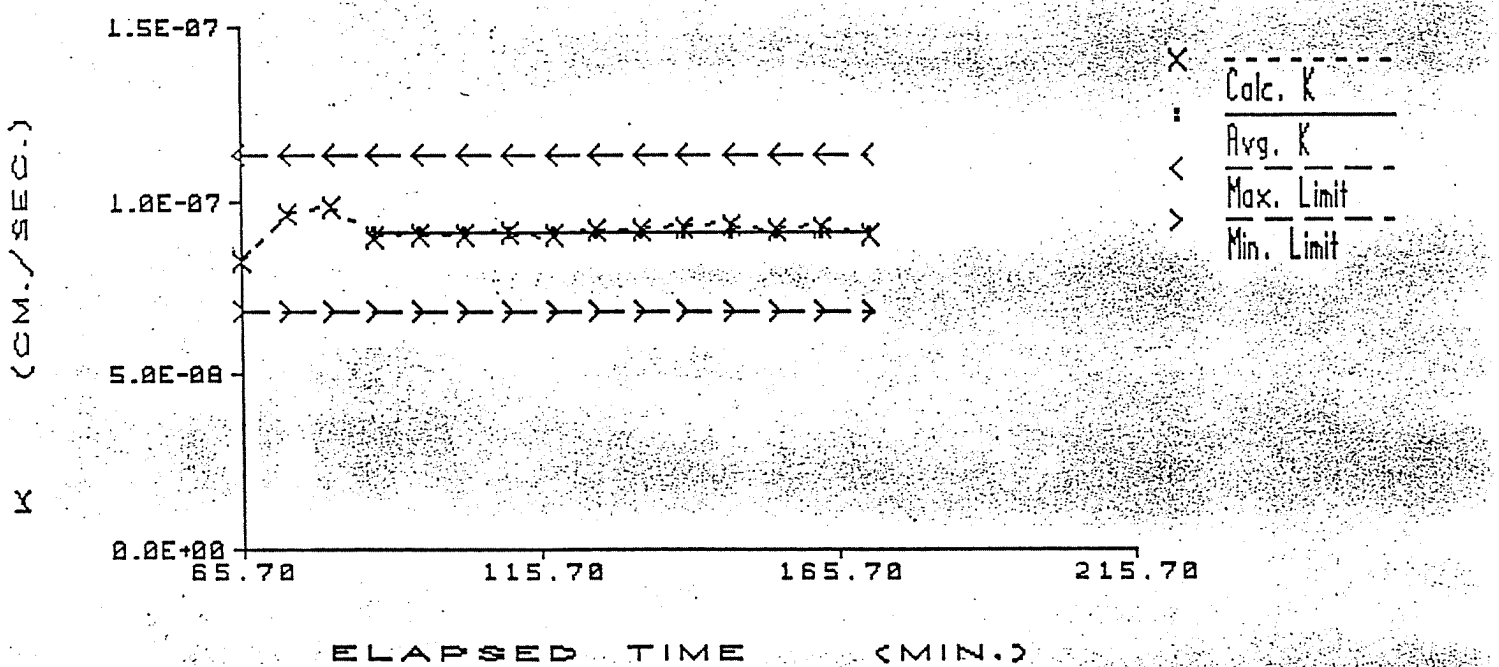
SAMPLE DATA:	INITIAL	FINAL
DIAMETER (in.)	2.831	2.807
LENGTH (in.)	1.971	1.930
WATER CONTENT (%)	16.0	20.3
DRY UNIT WEIGHT (pcf.)	103.6	107.6

TEST PARAMETERS:

TOTAL BACK PRESSURE (psi.)	100
MAXIMUM EFFECTIVE STRESS (psi.)	5
MINIMUM EFFECTIVE STRESS (psi.)	3
INITIAL HYDRAULIC GRADIENT	31
FINAL HYDRAULIC GRADIENT	28
PERMEANT LIQUID	DEAIRED TAP WATER

AVERAGE HYDRAULIC CONDUCTIVITY (cm./sec.) 9.1E-08

PERMEABILTY vs TIME



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APPENDIX B

ANALYTICAL LAB DATA VALIDATION REPORTS - BACKFILL MATERIAL

TreaTek-CRA
2055 Niagara Falls Boulevard
Suite Three
Niagara Falls, New York 14304
(716) 297-2160
(716) 297-2265 Telecopier

MEMO

Bill Sharon

TO: Jim Thornton

REFERENCE NO: 9920

FROM: Denise Tuhovak/ms/16

DATE: February 5, 1998
(REVISED: February 6, 1998)

RE: 102nd Street Source Materials

CC: A. Weston, L. Miller

EXECUTIVE SUMMARY

Representative soil samples were collected and analyzed for target compound list/target analyte list (TCL/TAL) organics and metals to characterize the soils for use as backfill at the 102nd Street landfill. Based on the results of these analyses, it was determined that these soils are acceptable for this use.

INTRODUCTION

Composite samples were collected between 1996 and 1997 from six different soil sources. The samples were analyzed for TCL/TAL organics and metals to characterize the material for use as backfill at the 102nd Street Landfill. A QA/QC review was performed on the data and a copy is attached to this memo.

RESULTS

A copy of the analytical results is summarized in the attached Table 1. Organic compounds were not detected in the samples with the exception of some very low level bis(2-ethylhexyl)phthalate (a common laboratory artifact). Various metals were detected in the samples at different concentrations.

Based on the QA/QC review, these data were acceptable for use in characterizing the soil material.

DISCUSSION

The analytical data were compared to New York State Department of Environmental Conservation (NYSDEC) criteria to determine if the soils could be recommended for use at the 102nd Street Landfill. Since the 102nd Street Landfill is a secured area, the organic data for these samples were compared to the Soil Cleanup Objectives to Protect Groundwater Quality (TAGM, January 1994) and the sample results met these levels.

Metals results are normally compared to site background levels; the TAGM Eastern USA Background Level were used for reference purposes only. Four metals exceeded the TAGM Eastern USA Background Levels. The exceedances were as follows:

Metal	*Eastern USA Background Level (ppm)*	*Sample Result (ppm)*
Cadmium	0.1-1	ND-1.1
Calcium	130-3500	1000-160000
Nickel	0.5-2.5	3.2-31
Zinc	9-50	28-100

The exceedances for cadmium, nickel and zinc are minor, and the concentrations are comparable to the site background levels expected in an industrial area such as Niagara Falls. Calcium is not a heavy metal and the high calcium concentrations are not a concern.

CONCLUSION

The soil samples contain various metals and low levels of bis(2-ethylhexly)phthalate. Based on the analytical results, it was determined that the soils are acceptable for use at the 102nd Street Landfill.

TABLE 1

ANALYTICAL RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Soil Source	*FRONTIER-01*	*CERRONEGI-01*	*CARL WALCK*	*SUMMIT PARK*	*HELMICK*	*CHESTNUT RIDGE*
	Units						
TCL Volatiles							
Chloromethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Bromomethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Vinyl chloride	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Chloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Methylene chloride	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Acetone	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 16	ND 300
Carbon disulfide	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,1-Dichloroethene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,1-Dichloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,2-Dichloroethene (total)	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
2-Butanone	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Chloroform	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,2-Dichloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,1,1-Trichloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Carbon tetrachloride	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Bromodichloromethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,2-Dichloropropane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
cis-1,3-Dichloropropene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Trichloroethene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Benzene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Dibromochloromethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
trans-1,3-Dichloropropene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,1,2-Trichloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Bromoform	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
4-Methyl-2-pentanone	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
2-Hexanone	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Tetrachloroethene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,1,2,2-Tetrachloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Toluene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Chlorobenzene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Ethyl benzene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Styrene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Xylene (total)	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300

TABLE 1

ANALYTICAL RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Soil Source	*FRONTIER-01*	*CERRONEGI-01*	*CARL WALCK*	*SUMMIT PARK*	*HELMICK*	*CHESTNUT RIDGE*
	Units						
TCL Semi-Volatiles							
Phenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
bis(2-Chloroethyl) ether	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2-Chlorophenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
1,3-Dichlorobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
1,4-Dichlorobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
1,2-Dichlorobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2-Methylphenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,2'oxybis(1-Chloropropane)	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Methylphenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
n-Nitroso-di-n-propylamine	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Hexachloroethane	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Nitrobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Isophorone	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2-Nitrophenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,4-Dimethylphenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
bis(2-Chloroethoxy)methane	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,4-Dichlorophenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
1,2,4-Trichlorobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Naphthalene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Chloroaniline	µg/Kg	ND 410	ND 400	ND 660	ND 420	ND 410	ND 330
Hexachlorobutadiene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Chloro-3-methylphenol	µg/Kg	ND 410	ND 400	ND 660	ND 420	ND 410	ND 330
2-Methylnaphthalene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Hexachlorocyclopentadiene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,4,6-Trichlorophenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,4,5-Trichlorophenol	µg/Kg	ND 1000	ND 990	ND 330	ND 1100	ND 1000	ND 1600
2-Chloronaphthalene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2-Nitroaniline	µg/Kg	ND 1000	ND 990	ND 1600	ND 1100	ND 1000	ND 1600
Dimethyl phthalate	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Acenaphthylene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,6-Dinitrotoluene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
3-Nitroaniline	µg/Kg	ND 1000	ND 990	ND 330	ND 1100	ND 1000	ND 1600
Acenaphthene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,4-Dinitrophenol	µg/Kg	ND 1000	ND 990	ND 1600	ND 1100	ND 1000	ND 1600
4-Nitrophenol	µg/Kg	ND 1000	ND 990	ND 1600	ND 1100	ND 1000	ND 1600
Dibenzofuran	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330

TABLE 1

ANALYTICAL RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Soil Source	*FRONTIER-01*	*CERRONEGI-01*	*CARL WALCK*	*SUMMIT PARK*	*HELMICK*	*CHESTNUT RIDGE*
	Units						
TCL Semi-Volatiles (Cont'd.)							
2,4-Dinitrotoluene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Diethylphthalate	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Fluorene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Chlorophenyl phenyl ether	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Nitroaniline	µg/Kg	ND 1000	ND 990	ND 660	ND 1100	ND 1000	ND 1600
4,6-Dinitro-2-methylphenol	µg/Kg	ND 1000	ND 990	ND 1600	ND 1100	ND 1000	ND 1600
n-Nitrosodiphenylamine	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Bromophenyl phenyl ether	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Hexachlorobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Pentachlorophenol	µg/Kg	ND 1000	ND 990	ND 1600	ND 1100	ND 1000	ND 1600
Phenanthrene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Anthracene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Carbazole	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Di-n-butyl phthalate	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Fluoranthene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Pyrene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Butyl benzyl phthalate	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Benzo(a)anthracene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
3,3'-Dichlorobenzidine	µg/Kg	ND 410	ND 400	ND 660	ND 420	ND 410	ND 660
Chrysene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
bis(2-Ethylhexyl)phthalate	µg/Kg	ND 410	ND 400	ND 330	67J	57J	ND 330
Di-n-octyl phthalate	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Benzo(b)fluoranthene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Benzo(k)fluoranthene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Benzo(a)pyrene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Indeno(1,2,3-cd)pyrene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Dibenzo(a,h)anthracene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Benzo(g,h,i)perylene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330

TABLE 1

ANALYTICAL RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Soil Source	*FRONTIER-01*	*CERRONEGI-01*	*CARL WALCK*	*SUMMIT PARK*	*HELMICK*	*CHESTNUT RIDGE*
	Units						
Pesticides/PCBs							
alpha-BHC	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
beta-BHC	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
delta-BHC	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
gamma-BHC (Lindane)	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Heptachlor	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Aldrin	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Heptachlor epoxide	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Endosulfan I	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Dieldrin	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
4,4'-DDE	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
Endrin	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
Endosulfan II	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
4,4'-DDD	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
Endosulfan sulfate	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
4,4'-DDT	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
Methoxychlor	µg/Kg	ND 21	ND 20	ND 19	ND 21	ND 21	ND 21
Endrin ketone	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
Endrin aldehyde	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
alpha-Chlordane	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
gamma-Chlordane	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Toxaphene	µg/Kg	ND 210	ND 200	ND 190	ND 210	ND 210	ND 210
Aroclor-1016	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41
Aroclor-1221	µg/Kg	ND 82	ND 79	ND 76	ND 84	ND 83	ND 83
Aroclor-1232	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41
Aroclor-1242	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41
Aroclor-1248	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41
Aroclor-1254	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41
Aroclor-1260	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41

TABLE 1

ANALYTICAL RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Soil Source	*FRONTIER-01*	*CERRONEGI-01*	*CARL WALCK*	*SUMMIT PARK*	*HELMICK*	*CHESTNUT RIDGE*
	Units						
TAL Metals							
Aluminum	mg/Kg	9400	11000	4300	20000.0	12000	4400
Antimony	mg/Kg	ND 5.0	ND 5.0	ND 5.3	0.81	ND 5.0	ND 5.4
Arsenic	mg/Kg	7.3J	5.4J	ND 0.5	4.8	8.6J	3.9J
Barium	mg/Kg	100	100	35	140	100	27
Beryllium	mg/Kg	ND 0.5	ND 0.5	ND 0.5	1.0	ND 0.5	ND 0.5
Cadmium	mg/Kg	ND 0.5	ND 0.5	1.1	ND 0.03	ND 0.5	ND 0.5
Calcium	mg/Kg	14000	160000	29000	55000	51000	1000
Chromium	mg/Kg	14	17	6.6	29	15	4.3
Cobalt	mg/Kg	9.2	10	3.0	14	9.9	ND 1.1
Copper	mg/Kg	14	18	6.1	27	23	2.2
Iron	mg/Kg	17000	31000	7000	32000	22000	4400
Lead	mg/Kg	22	28	ND 5.3	12	21	22
Magnesium	mg/Kg	12000	38000	4600	14000	10000	530
Manganese	mg/Kg	690	700	340	610	580	22
Mercury	mg/Kg	ND 0.5	ND 0.5	ND 0.5	ND 0.06	ND 0.5	ND 0.5
Nickel	mg/Kg	20	18	7.7	31	18	3.2
Potassium	mg/Kg	1900	2700	660	5300	1300	180
Selenium	mg/Kg	ND 0.5	ND 0.5	ND 0.5	ND 0.30	ND 0.5	ND 0.5
Silver	mg/Kg	ND 0.5	ND 0.5	ND 0.5	ND 0.10	ND 0.5	ND 0.5
Sodium	mg/Kg	160	240	130	300	140	55
Thallium	mg/Kg	ND 5.0	6.5	77	ND 0.24	120	31
Vanadium	mg/Kg	16	20	6.2	40	18	7.5
Zinc	mg/Kg	46	100	77	70	50	28

Notes:

-	Not Applicable.
J	Estimated.
NDx	Not detected at or above x.
PCBs	Polychlorinated Biphenyls.
R	Data Rejected.
TAL	Target Analyte List.
TCL	Target Compound List.

ANALYTICAL RESULTS AND QA/QC REVIEW
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

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1.0 EXECUTIVE SUMMARY

Soil was obtained from six different sources for use as backfill at the 102nd Street Landfill. Representative composite samples were collected from each source and analyzed for target compound list/target analyte list (TCL/TAL) organics and metals to characterize the material.

A quality assurance/quality control (QA/QC) assessment was performed on the data and all results were judged to be acceptable. The results were all non-detect with the exception of some low level bis(2-ethyhexyl)phthalate concentrations and various concentrations of some metals.

2.0 QA/QC REVIEW

Introduction

Composite soil samples were collected between June 1996 and July 1997 from sources of material for use as backfill at the 102nd Street Landfill. The samples were analyzed for TCL organics and TAL metals. Upon initial review of the data, it was determined that supporting QA/QC data were not available for some of the analytical reports. Additional samples were collected from these sources and analyzed for the appropriate parameters. A sampling and analysis summary is presented in Table 1 and the analytical methods used are summarized in Table 2. The analytical results are summarized in Table 3.

Final sample results and supporting QA/QC results (including spike recoveries, duplicate results, surrogate recoveries internal standard recoveries and laboratory blank results) were assessed to determine whether the data were acceptable for their intended use - characterization of the backfill material.

The criteria by which these data were assessed are outlined in the analytical methods and the guidance documents entitled "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA 540/R-94-012, February 1994 and "USEPA Contract Laboratory Program National Function Guidelines for Inorganic Data Review, February 1994, EPA 540/R-94/013.

Sample Holding Times

The sample holding time criteria used were as follows:

Parameter	*Holding Time*
Volatiles	14 days from collection to extraction
Semi-Volatiles	14 days from collection to extraction, 40 days from extraction to analysis
Pesticides/PCBs	14 days from collection to extraction, 40 days from extraction to analysis
Metals (Except Mercury)	180 days from collection to analysis
Mercury	28 days from collection to analysis

As summarized in table 4, all samples were prepared and analyzed within the required holding times with the exception of two volatiles samples which were analyzed one day outside of the holding time. The volatiles results reported for these samples were judged to be acceptable based on the minor extent of the exceedance.

Surrogate Analyses - Organics

Surrogates were added to all samples, blanks, and QC samples prior to extraction and/or analysis for organic parameters, and the recoveries are summarized in Table 5. All recoveries were acceptable showing acceptable analytical accuracy.

Internal Standard Analysis - Volatiles and Semi-volatiles

The proper internal standard (IS) compounds were added to all samples, blanks, standards, and spiked samples prior to analysis. All IS recoveries were acceptable with the exception of sample the from Chestnut Ridge which had one low semi-volatile IS recovery. All associated sample results were

non-detect and were judged to be acceptable based on the minor extent of the exceedance.

Method Blank Analyses

Method blanks were extracted and/or analyzed for all parameters, and the results are summarized in Table 6. The results were non-detect with the following exceptions:

i) Low level concentrations of methylene chloride and acetone (common laboratory artifacts) were detected in one of the blanks. Associated sample results at concentrations near the blank levels were qualified non-detect.

ii) Some metals were detected in one of the laboratory blanks at low concentrations. The concentrations of these metals in the associated sample were significantly higher than the levels in the blank and the results would not have been affected.

Blank Spike (BS) Analyses

BSs containing a representative set of the analytes of interest were prepared and analyzed for all parameters. BS recoveries were assessed against general control limits and are summarized in Table 7. All BS recoveries were within the control limits showing acceptable overall analytical accuracy.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses - Organics

MS/MSD samples were prepared and analyzed for the organic parameters and the results are summarized in Table 8. The spike recoveries showed acceptable accuracy and precision with the following exceptions:

i) Slightly high recoveries were reported for a few volatile compounds. These compounds were not detected in the samples and the data would not have been affected by a potential high bias.

ii) there was a low endrin recovery for the MSD analysis. Based on acceptable recoveries for the MS and the BS for this compound, and the fact that this compound and its decomposition metabolites were not detected in associated samples, the results for this compound were judged to be acceptable.

Duplicate Analyses - Metals

Two separate portions of one composite sample were prepared and analyzed separately for all metals of interest (see Table 9). The results compared well showing good overall analytical precision.

Graphite Furnace Analyses

Several of the arsenic and selenium analyses exceeded the specified post-digestion spike recoveries or coefficients of variation criteria. All associated positive sample results were qualified as estimated, all non-detect results were judged to be acceptable based on sufficient analyte recovery.

3.0 CONCLUSION

Based on the QA/QC review, the data reported in Table 3 were judged to be acceptable for their intended use with the qualifications noted.

TABLE 1

SAMPLING AND ANALYSIS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

Location	*Sample ID*	*Date*	*Parameters*
Frontier-01	GNN6265	06/04/96	TCL VOCs, TAL Metals
	Comp B	12/11/97	TCL SVOCs, Pesticides/PCBs
Cerrone GI-01	GNN62AL	06/17/96	TCL VOCs, TAL Metals
	Comp E	12/11/97	TCL SVOCs, Pesticides/PCBs
Summit Park	GNN633C-1	09/23/96	(1)
	Comp F	12/15/97	TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs, TAL Metals
Helmick	HAT722Z	05/27/97	TAL Metals
	Comp A	12/11/97	TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs
Chestnut Ridge	GNN72K4-1	07/29/97	TCL VOCs, TCL SVOCs, TAL Metals
	Comp D	12/11/97	TCL Pesticides/PCBs
Carl Walck	GNN72MA-2	08/07/97	TCL SVOCs, TAL Metals
	Comp C	12/11/97	TCL VOCs, Pesticides/PCBs

Notes:
(1) Analytical results for this sample were not used due to the unavailability of supporting QA/QC data.
PCBs Polychlorinated Biphenyls.
SVOC Semi-Volatile Organic Compounds.
TAL Target Analyte List.
TCL Target Compound List.
VOCs Volatile Organic Compounds.

TABLE 2

ANALYTICAL METHODS
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

Parameter	*Method (1)*
TCL VOCs	8240
TCL SVOCs	8270
TCL Pesticides/PCBs	8080
TAL Metals	6010/7060/7471/7740

Notes:

(1) Methods referenced from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, SW-846, September 1986 (with revisions).

PCBs Polychlorinated Biphenyls.

SVOC Semi-Volatile Organic Compounds.

TAL Target Analyte List.

TCL Target Compound List.

VOCs Volatile Organic Compounds.

TABLE 3

ANALYTICAL RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Soil Source	*FRONTIER-01*	*CERRONEGI-01*	*CARL WALCK*	*SUMMIT PARK*	*HELMICK*	*CHESTNUT RIDGE*
	Units						
TCL Volatiles							
Chloromethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Bromomethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Vinyl chloride	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Chloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Methylene chloride	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Acetone	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 16	ND 300
Carbon disulfide	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,1-Dichloroethene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,1-Dichloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,2-Dichloroethene (total)	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
2-Butanone	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Chloroform	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,2-Dichloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,1,1-Trichloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Carbon tetrachloride	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Bromodichloromethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,2-Dichloropropane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
cis-1,3-Dichloropropene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Trichloroethene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Benzene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Dibromochloromethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
trans-1,3-Dichloropropene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,1,2-Trichloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Bromoform	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
4-Methyl-2-pentanone	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
2-Hexanone	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Tetrachloroethene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
1,1,2,2-Tetrachloroethane	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Toluene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Chlorobenzene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Ethyl benzene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Styrene	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300
Xylene (total)	µg/Kg	ND 10	ND 10	ND 11	ND 13	ND 12	ND 300

TABLE 3

ANALYTICAL RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Soil Source *Units*	*FRONTIER-01*	*CERRONEGI-01*	*CARL WALCK*	*SUMMIT PARK*	*HELMICK*	*CHESTNUT RIDGE*
TCL Semi-Volatiles							
Phenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
bis(2-Chloroethyl) ether	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2-Chlorophenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
1,3-Dichlorobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
1,4-Dichlorobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
1,2-Dichlorobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2-Methylphenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,2'oxybis(1-Chloropropane)	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Methylphenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
n-Nitroso-di-n-propylamine	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Hexachloroethane	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Nitrobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Isophorone	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2-Nitrophenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,4-Dimethylphenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
bis(2-Chloroethoxy)methane	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,4-Dichlorophenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
1,2,4-Trichlorobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Naphthalene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Chloroaniline	µg/Kg	ND 410	ND 400	ND 660	ND 420	ND 410	ND 330
Hexachlorobutadiene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Chloro-3-methylphenol	µg/Kg	ND 410	ND 400	ND 660	ND 420	ND 410	ND 330
2-Methylnaphthalene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Hexachlorocyclopentadiene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,4,6-Trichlorophenol	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,4,5-Trichlorophenol	µg/Kg	ND 1000	ND 990	ND 330	ND 1100	ND 1000	ND 1600
2-Chloronaphthalene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2-Nitroaniline	µg/Kg	ND 1000	ND 990	ND 1600	ND 1100	ND 1000	ND 1600
Dimethyl phthalate	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Acenaphthylene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,6-Dinitrotoluene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
3-Nitroaniline	µg/Kg	ND 1000	ND 990	ND 330	ND 1100	ND 1000	ND 1600
Acenaphthene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
2,4-Dinitrophenol	µg/Kg	ND 1000	ND 990	ND 1600	ND 1100	ND 1000	ND 1600
4-Nitrophenol	µg/Kg	ND 1000	ND 990	ND 1600	ND 1100	ND 1000	ND 1600
Dibenzofuran	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330

TABLE 3

ANALYTICAL RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Soil Source	*FRONTIER-01*	*CERRONEGI-01*	*CARL WALCK*	*SUMMIT PARK*	*HELMICK*	*CHESTNUT RIDGE*
	Units						
TCL Semi-Volatiles (Cont'd.)							
2,4-Dinitrotoluene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Diethylphthalate	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Fluorene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Chlorophenyl phenyl ether	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Nitroaniline	µg/Kg	ND 1000	ND 990	ND 660	ND 1100	ND 1000	ND 1600
4,6-Dinitro-2-methylphenol	µg/Kg	ND 1000	ND 990	ND 1600	ND 1100	ND 1000	ND 1600
n-Nitrosodiphenylamine	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
4-Bromophenyl phenyl ether	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Hexachlorobenzene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Pentachlorophenol	µg/Kg	ND 1000	ND 990	ND 1600	ND 1100	ND 1000	ND 1600
Phenanthrene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Anthracene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Carbazole	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Di-n-butyl phthalate	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Fluoranthene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Pyrene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Butyl benzyl phthalate	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Benzo(a)anthracene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
3,3'-Dichlorobenzidine	µg/Kg	ND 410	ND 400	ND 660	ND 420	ND 410	ND 660
Chrysene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
bis(2-Ethylhexyl)phthalate	µg/Kg	ND 410	ND 400	ND 330	67J	57J	ND 330
Di-n-octyl phthalate	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Benzo(b)fluoranthene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Benzo(k)fluoranthene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Benzo(a)pyrene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Indeno(1,2,3-cd)pyrene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Dibenzo(a,h)anthracene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330
Benzo(g,h,i)perylene	µg/Kg	ND 410	ND 400	ND 330	ND 420	ND 410	ND 330

TABLE 3

ANALYTICAL RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Soil Source	*FRONTIER-01*	*CERRONEGI-01*	*CARL WALCK*	*SUMMIT PARK*	*HELMICK*	*CHESTNUT RIDGE*
	Units						
Pesticides/PCBs							
alpha-BHC	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
beta-BHC	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
delta-BHC	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
gamma-BHC (Lindane)	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Heptachlor	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Aldrin	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Heptachlor epoxide	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Endosulfan I	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Dieldrin	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
4,4'-DDE	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
Endrin	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
Endosulfan II	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
4,4'-DDD	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
Endosulfan sulfate	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
4,4'-DDT	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
Methoxychlor	µg/Kg	ND 21	ND 20	ND 19	ND 21	ND 21	ND 21
Endrin ketone	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
Endrin aldehyde	µg/Kg	ND 4.0	ND 3.9	ND 3.8	ND 4.2	ND 4.1	ND 4.1
alpha-Chlordane	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
gamma-Chlordane	µg/Kg	ND 2.1	ND 2.0	ND 1.9	ND 2.1	ND 2.1	ND 2.1
Toxaphene	µg/Kg	ND 210	ND 200	ND 190	ND 210	ND 210	ND 210
Aroclor-1016	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41
Aroclor-1221	µg/Kg	ND 82	ND 79	ND 76	ND 84	ND 83	ND 83
Aroclor-1232	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41
Aroclor-1242	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41
Aroclor-1248	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41
Aroclor-1254	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41
Aroclor-1260	µg/Kg	ND 40	ND 39	ND 38	ND 42	ND 41	ND 41

TABLE 3

ANALYTICAL RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Soil Source Units	*FRONTIER-01*	*CERRONEGI-01*	*CARL WALCK*	*SUMMIT PARK*	*HELMICK*	*CHESTNUT RIDGE*
TAL Metals							
Aluminum	mg/Kg	9400	11000	4300	20000.0	12000	4400
Antimony	mg/Kg	ND 5.0	ND 5.0	ND 5.3	0.81	ND 5.0	ND 5.4
Arsenic	mg/Kg	7.3J	5.4J	ND 0.5	4.8	8.6J	3.9J
Barium	mg/Kg	100	100	35	140	100	27
Beryllium	mg/Kg	ND 0.5	ND 0.5	ND 0.5	1.0	ND 0.5	ND 0.5
Cadmium	mg/Kg	ND 0.5	ND 0.5	1.1	ND 0.03	ND 0.5	ND 0.5
Calcium	mg/Kg	14000	160000	29000	55000	51000	1000
Chromium	mg/Kg	14	17	6.6	29	15	4.3
Cobalt	mg/Kg	9.2	10	3.0	14	9.9	ND 1.1
Copper	mg/Kg	14	18	6.1	27	23	2.2
Iron	mg/Kg	17000	31000	7000	32000	22000	4400
Lead	mg/Kg	22	28	ND 5.3	12	21	22
Magnesium	mg/Kg	12000	38000	4600	14000	10000	530
Manganese	mg/Kg	690	700	340	610	580	22
Mercury	mg/Kg	ND 0.5	ND 0.5	ND 0.5	ND 0.06	ND 0.5	ND 0.5
Nickel	mg/Kg	20	18	7.7	31	18	3.2
Potassium	mg/Kg	1900	2700	660	5300	1300	180
Selenium	mg/Kg	ND 0.5	ND 0.5	ND 0.5	ND 0.30	ND 0.5	ND 0.5
Silver	mg/Kg	ND 0.5	ND 0.5	ND 0.5	ND 0.10	ND 0.5	ND 0.5
Sodium	mg/Kg	160	240	130	300	140	55
Thallium	mg/Kg	ND 5.0	6.5	77	ND 0.24	120	31
Vanadium	mg/Kg	16	20	6.2	40	18	7.5
Zinc	mg/Kg	46	100	77	70	50	28

Notes:

-	Not Applicable.
J	Estimated.
NDx	Not detected at or above x.
PCBs	Polychlorinated Biphenyls.
R	Data Rejected.
TAL	Target Analyte List.
TCL	Target Compound List.

TABLE 4

HOLDING TIME SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

Sample ID	*Sample Date*	*Extraction Date*	*Analysis Date*	*Holding Time Exceedance (days)*	
				to Extraction	*to Analysis*
VOCs					
Frontier Stone	06/04/96	-	06/05/96	-	0
Summit Park	12/15/97	-	12/19/97	-	0
Cerrone GI	06/17/96	-	06/18/96	-	0
Carl Walck	12/11/97	-	12/19/97	-	1
Chestnut Ridge	07/29/97	-	07/30/97	-	0
Helmick	12/11/97	-	12/19/97	-	1
SVOCs					
Frontier Stone	12/11/97	12/16/97	12/18/97	0	0
Summit Park	12/15/97	12/16/97	12/18/97	0	0
Cerrone GI	12/11/97	12/16/97	12/18/97	0	0
Helmick	12/11/97	12/16/97	12/18/97	0	0
Carl Walck	08/07/97	08/11/97	08/11/97	0	0
Chestnut Ridge	07/29/97	07/31/97	08/04/97	0	0
Pesticides/PCBs					
Frontier Stone	12/11/97	12/16/97	12/31/97	0	0
Summit Park	12/15/97	12/16/97	12/31/97	0	0
Cerrone GI	12/11/97	12/16/97	12/31/97	0	0
Helmick	12/11/97	12/16/97	01/01/98	0	0
Carl Walck	12/11/97	12/16/97	12/31/97	0	0
Chestnut Ridge	12/11/97	12/16/97	12/31/97	0	0
Metals except Mercury					
Frontier Stone	06/04/96	-	06/96	-	0
Summit Park	12/15/97	-	1/98	-	0
Cerrone GI	06/17/96	-	06/96	-	0
Helmick	05/27/97	-	05/97	-	0
Carl Walck	08/07/97	-	08/97	-	0
Chestnut Ridge	07/29/97	-	07/97	-	0
Mercury					
Frontier Stone	06/04/96	-	06/05/96	-	0
Summit Park	12/15/97	-	12/23/97	-	0
Cerrone GI	06/17/96	-	06/18/96	-	0
Helmick	05/27/97	-	05/28/97	-	0
Carl Walck	08/07/97	-	08/08/97	-	0
Chestnut Ridge	07/29/97	-	07/30/97	-	0

Notes:
Dup Duplicate.
- Not Applicable.
PCBs Polychlorinated Biphenyls.
SVOC Semi-Volatile Organic Compounds.
VOCs Volatile Organic Compounds.

TABLE 5

SURROGATE RECOVERY SUMMARY (PERCENT)
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

Surrogate:	*DCA*	*TOL*	*BFB*
Recovery Limits:	*70-121*	*81-117*	*74-121*
VOCs			
Frontier Stone	88	104	94
Summit Park	88	95	86
Cerrone GI	94	100	100
Carl Walck	91	86	85
Chestnut Ridge	93	101	95
Helmick	89	98	82

Surrogate:	*2-FP*	*PHL*	*2CP (1)*	*DCB (1)*	*NBZ*	*FBP*	*TBP*	*TPH*
Recovery Limits:	*25-121*	*24-113*	*20-130*	*20-130*	*23-120*	*30-115*	*19-122*	*18-137*
SVOCs								
Frontier Stone	80	85	80	70	72	64	60	67
Cerron GI	78	86	79	70	70	63	59	66
Helmick	77	84	77	67	74	65	60	65
Carl Walck	63	75	-	-	68	71	77	109
Chestnut Ridge	72	90	-	-	84	96	89	111
Summit Park	78	85	79	69	71	66	58	68

Surrogates:	*TCMX*	*TCMX*	*DCBP*	*DCBP*
Control Limits:	*60-150*	*60-150*	*60-150*	*60-150*
Pesticides				
Helmick	81	106	88	98
Frontier Stone	101	94	105	95
Carl Walck	80	74	95	87
Chestnut Ridge	91	89	92	89
Cerrone GI	82	81	92	79
Summit Park	87	93	94	92

Notes:
(1) Optional surrogate, not required.
- Not available

Surrogates:
BFB Bromofluorobenzene
DCA Dichloroethane-d4.
TOL Toluene-d4.
FBP 2-Fluorobiphenyl.
TBP 2,4,6-Tribromophenol.
2-FP 2-Fluorophenol.
PHL Phenol-d6.
NBZ Nitrobenzene-d5.
TPH Terphenyl-d14.
DCBP Decachlorobiphenyl
TCMX Tetrachloro-m-xylene
2CP 2-Chlorophenol-d4
DCB 1,2-Dichlorobenzene-d4

TABLE 6

METHOD BLANK RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

Analysis Date:		*06/05/96*	*06/18/96*	*07/30/97*	*12/19/97*
	Units				
TCL Volatiles					
Chloromethane	µg/Kg	ND 10	ND 10	ND 10	ND 10
Bromomethane	µg/Kg	ND 10	ND 10	ND 10	ND 10
Vinyl chloride	µg/Kg	ND 10	ND 10	ND 10	ND 10
Chloroethane	µg/Kg	ND 10	ND 10	ND 10	ND 10
Methylene chloride	µg/Kg	ND 10	ND 10	ND 10	3J
Acetone	µg/Kg	ND 10	ND 10	ND 10	2J
Carbon disulfide	µg/Kg	ND 10	ND 10	ND 10	ND 10
1,1-Dichloroethene	µg/Kg	ND 10	ND 10	ND 10	ND 10
1,1-Dichloroethane	µg/Kg	ND 10	ND 10	ND 10	ND 10
1,2-Dichloroethene (total)	µg/Kg	ND 10	ND 10	ND 10	ND 10
2-Butanone	µg/Kg	ND 10	ND 10	ND 10	ND 10
Chloroform	µg/Kg	ND 10	ND 10	ND 10	ND 10
1,2-Dichloroethane	µg/Kg	ND 10	ND 10	ND 10	ND 10
1,1,1-Trichloroethane	µg/Kg	ND 10	ND 10	ND 10	ND 10
Carbon tetrachloride	µg/Kg	ND 10	ND 10	ND 10	ND 10
Bromodichloromethane	µg/Kg	ND 10	ND 10	ND 10	ND 10
1,2-Dichloropropane	µg/Kg	ND 10	ND 10	ND 10	ND 10
cis-1,3-Dichloropropene	µg/Kg	ND 10	ND 10	ND 10	ND 10
Trichloroethene	µg/Kg	ND 10	ND 10	ND 10	ND 10
Benzene	µg/Kg	ND 10	ND 10	ND 10	ND 10
Dibromochloromethane	µg/Kg	ND 10	ND 10	ND 10	ND 10
trans-1,3-Dichloropropene	µg/Kg	ND 10	ND 10	ND 10	ND 10
1,1,2-Trichloroethane	µg/Kg	ND 10	ND 10	ND 10	ND 10
Bromoform	µg/Kg	ND 10	ND 10	ND 10	ND 10
4-Methyl-2-pentanone	µg/Kg	ND 10	ND 10	ND 10	ND 10
2-Hexanone	µg/Kg	ND 10	ND 10	ND 10	ND 10
Tetrachloroethene	µg/Kg	ND 10	ND 10	ND 10	ND 10
1,1,2,2-Tetrachloroethane	µg/Kg	ND 10	ND 10	ND 10	ND 10
Toluene	µg/Kg	ND 10	ND 10	ND 10	ND 10
Chlorobenzene	µg/Kg	ND 10	ND 10	ND 10	ND 10
Ethyl benzene	µg/Kg	ND 10	ND 10	ND 10	ND 10
Styrene	µg/Kg	ND 10	ND 10	ND 10	ND 10
Xylene (total)	µg/Kg	ND 10	ND 10	ND 10	ND 10

TABLE 6

METHOD BLANK RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

Extraction Date:	*Units*	*08/11/97*	*07/31/97*	*12/16/97*
TCL Semi-Volatiles				
Phenol	µg/Kg	ND 330	ND 330	ND 330
bis(2-Chloroethyl) ether	µg/Kg	ND 330	ND 330	ND 330
2-Chlorophenol	µg/Kg	ND 330	ND 330	ND 330
1,3-Dichlorobenzene	µg/Kg	ND 330	ND 330	ND 330
1,4-Dichlorobenzene	µg/Kg	ND 330	ND 330	ND 330
1,2-Dichlorobenzene	µg/Kg	ND 330	ND 330	ND 330
2-Methylphenol	µg/Kg	ND 330	ND 330	ND 330
2,2'-oxybis(1-Chloropropane)	µg/Kg	ND 330	ND 330	ND 330
4-Methylphenol	µg/Kg	ND 330	ND 330	ND 330
n-Nitroso-di-n-propylamine	µg/Kg	ND 330	ND 330	ND 330
Hexachloroethane	µg/Kg	ND 330	ND 330	ND 330
Nitrobenzene	µg/Kg	ND 330	ND 330	ND 330
Isophorone	µg/Kg	ND 330	ND 330	ND 330
2-Nitrophenol	µg/Kg	ND 330	ND 330	ND 330
2,4-Dimethylphenol	µg/Kg	ND 330	ND 330	ND 330
bis(2-Chloroethoxy)methane	µg/Kg	ND 330	ND 330	ND 330
2,4-Dichlorophenol	µg/Kg	ND 330	ND 330	ND 330
1,2,4-Trichlorobenzene	µg/Kg	ND 330	ND 330	ND 330
Naphthalene	µg/Kg	ND 330	ND 330	ND 330
4-Chloroaniline	µg/Kg	ND 330	ND 330	ND 330
Hexachlorobutadiene	µg/Kg	ND 330	ND 330	ND 330
4-Chloro-3-methylphenol	µg/Kg	ND 330	ND 330	ND 330
2-Methylnaphthalene	µg/Kg	ND 330	ND 330	ND 330
Hexachlorocyclopentadiene	µg/Kg	ND 330	ND 330	ND 330
2,4,6-Trichlorophenol	µg/Kg	ND 330	ND 330	ND 330
2,4,5-Trichlorophenol	µg/Kg	ND 330	ND 1600	ND 830
2-Chloronaphthalene	µg/Kg	ND 330	ND 330	ND 330
2-Nitroaniline	µg/Kg	ND 330	ND 1600	ND 830
Dimethyl phthalate	µg/Kg	ND 330	ND 330	ND 330
Acenaphthylene	µg/Kg	ND 330	ND 330	ND 330
2,6-Dinitrotoluene	µg/Kg	ND 330	ND 330	ND 330

TABLE 6

METHOD BLANK RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

Extraction Date:	*Units*	*08/11/97*	*07/31/97*	*12/16/97*
TCL Semi-Volatiles (Cont'd.)				
3-Nitroaniline	µg/Kg	ND 330	ND 1600	ND 830
Acenaphthene	µg/Kg	ND 330	ND 330	ND 330
2,4-Dinitrophenol	µg/Kg	ND 330	ND 1600	ND 830
4-Nitrophenol	µg/Kg	ND 330	ND 1600	ND 830
Dibenzofuran	µg/Kg	ND 330	ND 330	ND 330
2,4-Dinitrotoluene	µg/Kg	ND 330	ND 330	ND 330
Diethylphthalate	µg/Kg	ND 330	ND 330	ND 330
Fluorene	µg/Kg	ND 330	ND 330	ND 330
4-Chlorophenyl phenyl ether	µg/Kg	ND 330	ND 330	ND 330
4-Nitroaniline	µg/Kg	ND 330	ND 1600	ND 830
4,6-Dinitro-2-methylphenol	µg/Kg	ND 330	ND 1600	ND 830
n-Nitrosodiphenylamine	µg/Kg	ND 330	ND 330	ND 330
4-Bromophenyl phenyl ether	µg/Kg	ND 330	ND 330	ND 330
Hexachlorobenzene	µg/Kg	ND 330	ND 330	ND 330
Pentachlorophenol	µg/Kg	ND 330	ND 1600	ND 830
Phenanthrene	µg/Kg	ND 330	ND 330	ND 330
Anthracene	µg/Kg	ND 330	ND 330	ND 330
Carbazole	µg/Kg	ND 330	ND 330	ND 330
Di-n-butyl phthalate	µg/Kg	ND 330	ND 330	ND 330
Fluoranthene	µg/Kg	ND 330	ND 330	ND 330
Pyrene	µg/Kg	ND 330	ND 330	ND 330
Butyl benzyl phthalate	µg/Kg	ND 330	ND 330	ND 330
Benzo(a)anthracene	µg/Kg	ND 330	ND 330	ND 330
3,3'-Dichlorobenzidine	µg/Kg	ND 330	ND 660	ND 330
Chrysene	µg/Kg	ND 330	ND 330	ND 330
bis(2-Ethylhexyl)phthalate	µg/Kg	ND 330	ND 330	ND 330
Di-n-octyl phthalate	µg/Kg	ND 330	ND 330	ND 330
Benzo(b)fluoranthene	µg/Kg	ND 330	ND 330	ND 330
Benzo(k)fluoranthene	µg/Kg	ND 330	ND 330	ND 330
Benzo(a)pyrene	µg/Kg	ND 330	ND 330	ND 330
Indeno(1,2,3-cd)pyrene	µg/Kg	ND 330	ND 330	ND 330
Dibenzo(a,h)anthracene	µg/Kg	ND 330	ND 330	ND 330
Benzo(g,h,i)perylene	µg/Kg	ND 330	ND 330	ND 330

TABLE 6

METHOD BLANK RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Extraction Date:	*12/16/97*
	Units	
TCL Pesticides/PCBs		
alpha-BHC	µg/Kg	ND 1.7
beta-BHC	µg/Kg	ND 1.7
delta-BHC	µg/Kg	ND 1.7
gamma-BHC(Lindane)	µg/Kg	ND 1.7
Heptachlor	µg/Kg	ND 1.7
Aldrin	µg/Kg	ND 1.7
Heptachlor epoxide	µg/Kg	ND 1.7
Endosulfan I	µg/Kg	ND 1.7
Dieldrin	µg/Kg	ND 3.3
4,4'-DDE	µg/Kg	ND 3.3
Endrin	µg/Kg	ND 3.3
Endosulfan II	µg/Kg	ND 3.3
4,4'-DDD	µg/Kg	ND 3.3
Endosulfan sulfate	µg/Kg	ND 3.3
4,4'-DDT	µg/Kg	ND 3.3
Methoxychlor	µg/Kg	ND 17
Endrin ketone	µg/Kg	ND 3.3
Endrin aldehyde	µg/Kg	ND 3.3
alpha-Chlordane	µg/Kg	ND 1.7
gamma-Chlordane	µg/Kg	ND 1.7
Toxaphene	µg/Kg	ND 170
Aroclor-1016	µg/Kg	ND 33
Aroclor-1221	µg/Kg	ND 67
Aroclor-1232	µg/Kg	ND 33
Aroclor-1242	µg/Kg	ND 33
Aroclor-1248	µg/Kg	ND 33
Aroclor-1254	µg/Kg	ND 33
Aroclor-1260	µg/Kg	ND 33

TABLE 6

METHOD BLANK RESULTS SUMMARY
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Digestion Date: *Units*	*06/04/96*	*06/05/96*	*06/18/96*	*05/28/97*	*07/29/97*	*08/07/97*	*08/08/97*	*1/2/98*	*12/22/97*
TAL Metals										
Aluminum	mg/Kg	ND 5.0	-	ND 5.0	ND 5.0	ND 5.0	-	ND 5.0	1.5	-
Antimony	mg/Kg	ND 5.0	-	ND 5.0	ND 5.0	ND 5.0	-	ND 5.0	ND 0.25	-
Arsenic	mg/Kg	ND 0.5	-	ND 0.5	ND 0.5	ND 0.5	ND 0.5	-	ND 0.11	-
Barium	mg/Kg	ND 0.5	-	ND 0.5	ND 0.5	ND 0.5	-	ND 0.5	0.74	-
Beryllium	mg/Kg	ND 0.5	-	ND 0.5	ND 0.5	ND 0.5	-	ND 0.5	ND 0.010	-
Cadmium	mg/Kg	ND 0.5	-	ND 0.5	ND 0.5	ND 0.5	-	ND 0.5	ND 0.020	-
Calcium	mg/Kg	ND 10	-	ND 10	ND 10	ND 10	-	ND 10	7.0	-
Chromium	mg/Kg	ND 1.0	-	ND 1.0	ND 1.0	ND 1.0	-	ND 1.0	0.59	-
Cobalt	mg/Kg	ND 1.0	-	ND 1.0	ND 1.0	ND 1.0	-	ND 1.0	ND 0.13	-
Copper	mg/Kg	ND 1.0	-	ND 1.0	ND 1.0	ND 1.0	-	ND 1.0	0.12	-
Iron	mg/Kg	ND 5.0	-	ND 5.0	ND 5.0	ND 5.0	-	ND 5.0	1.3	-
Lead	mg/Kg	ND 5.0	-	ND 5.0	ND 5.0	ND 5.0	-	ND 5.0	ND 0.07	-
Magnesium	mg/Kg	ND 5.0	-	ND 5.0	ND 5.0	ND 5.0	-	ND 5.0	1.0	-
Manganese	mg/Kg	ND 0.5	-	ND 0.5	ND 0.5	ND 0.5	-	ND 0.5	0.063	-
Mercury	mg/Kg	-	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	-		ND 0.050
Nickel	mg/Kg	ND 2.0	-	ND 2.0	ND 2.0	ND 2.0	-	ND 2.0	ND 0.16	-
Potassium	mg/Kg	ND 100	-	ND 100	ND 100	ND 100	-	ND 100	1.6	-
Selenium	mg/Kg	ND 0.5	-	ND 0.5	ND 0.5	ND 0.5	-	ND 0.5	ND 0.24	-
Silver	mg/Kg	ND 0.5	-	ND 0.5	ND 0.5	ND 0.5	ND 0.5	-	0.10	-
Sodium	mg/Kg	ND 10	-	ND 10	ND 10	ND 10	-	ND 10	1.2	-
Thallium	mg/Kg	ND 5.0	-	ND 5.0	ND 5.0	ND 5.0	-	ND 5.0	ND 0.19	-
Vanadium	mg/Kg	ND 1.0	-	ND 1.0	ND 1.0	ND 1.0	-	ND 1.0	ND 0.10	-
Zinc	mg/Kg	ND 2.0	-	ND 2.0	ND 2.0	ND 2.0	-	ND 2.0	0.30	-

Notes:
TCL Target Compound List.
TAL Target Analyte List.
- Not Applicable.

TABLE 7

BLANK SPIKE RECOVERY RESULTS (PERCENT)
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Analysis Date: Control Limits	*06/05/96*	*06/18/96*	*07/30/97*	*12/19/97*
TCL Volatiles					
Chloromethane	56-128	122	124	118	114
Bromomethane	60-134	106	106	110	90
Vinyl chloride	48-137	92	102	112	120
Chloroethane	64-124	112	108	106	102
Methylene chloride	76-114	110	106	104	95
Acetone	31-171	-	-	116	54
Carbon disulfide	46-137	-	-	106	92
1,1-Dichloroethene	58-129	100	104	90	91
1,1-Dichloroethane	67-125	106	106	102	88
1,2-Dichloroethene (total)	73-115	98	94	108	92
2-Butanone	38-170	-	-	108	72
Chloroform	75-113	112	110	104	78
1,2-Dichloroethane	79-111	108	100	106	76
1,1,1-Trichloroethane	69-118	102	104	96	73
Carbon tetrachloride	62-124	106	108	96	75
Bromodichloromethane	80-109	104	106	100	80
1,2-Dichloropropane	80-111	112	112	108	89
cis-1,3-Dichloropropene	77-111	112	120	86	84
Trichloroethene	69-118	108	110	102	80
Benzene	73-115	104	106	102	86
Dibromochloromethane	80-109	112	110	98	81
trans-1,3-Dichloropropene	79-109	104	98	90	84
1,1,2-Trichloroethane	81-110	120	116	102	85
Bromoform	74-116	112	110	96	87
4-Methyl-2-pentanone	68-118	-	-	90	90
2-Hexanone	42-169	-	-	96	64
Tetrachloroethene	59-124	118	116	98	77
1,1,2,2-Tetrachloroethane	75-116	116	116	96	87
Toluene	71-115	104	108	104	81
Chlorobenzene	74-113	112	114	96	92
Ethyl benzene	58-149	110	112	98	77
Styrene	68-118	-	-	96	79
m-Xylene	67-118	-	-	94	-
o/p-Xylene	67-118	-	-	95	-
Xylene (total)	67-118	-	-	-	87

TABLE 7

BLANK SPIKE RECOVERY RESULTS (PERCENT)
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Extraction Date: Control Limits	*08/11/97*	*12/16/97*
TCL Semi-Volatiles			
Phenol	30-126	87	89
bis(2-Chloroethyl)ether	23-119	-	80
2-Chlorophenol	32-122	80	76
1,3-Dichlorobenzene	39-111	-	71
1,4-Dichlorobenzene	38-116	76	72
1,2-Dichlorobenzene	40-112	-	70
2-Methylphenol	27-141	-	77
2,2'-oxybis(1-Chloropropane)	39-108	-	104
4-Methylphenol	15-141	-	79
n-Nitroso-di-n-propylamine	19-133	90	91
Hexachloroethane	39-111	-	73
Nitrobenzene	39-129	-	80
Isophorone	30-126	-	75
2-Nitrophenol	37-121	-	70
2,4-Dimethylphenol	31-133	-	82
bis(2-Chloroethoxy)methane	46-112	-	70
2,4-Dichlorophenol	40-124	-	69
1,2,4-Trichlorobenzene	48-114	81	66
Naphthalene	46-118	-	74
4-Chloroaniline	13-121	-	32
Hexachlorobutadiene	49-115	-	64
4-Chloro-3-methylphenol	39-135	86	73
2-Methylnaphthalene	49-121	-	71
Hexachlorocyclopentadiene	14-98	-	32
2,4,6-Trichlorophenol	37-133	-	70
2,4,5-Trichlorophenol	16-148	-	68
2-Chloronaphthalene	47-125	-	73
2-Nitroaniline	33-135	-	80
Dimethylphthalate	49-127	-	72
Acenaphthylene	47-119	-	79
2,6-Dinitrotoluene	48-120	-	70
3-Nitroaniline	11-171	-	51
Acenaphthene	49-127	82	75
2,4-Dinitrophenol	10-99	-	53
4-Nitrophenol	10-166	72	66

TABLE 7

BLANK SPIKE RECOVERY RESULTS (PERCENT)
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Extraction Date: Control Limits	*08/11/97*	*12/16/97*
TCL Semi-Volatiles (Cont'd.)			
Dibenzofuran	48-120	-	73
2,4-Dinitrotoluene	46-118	88	69
Diethylphthalate	50-128	-	74
Fluorene	50-122	-	75
4-Chlorophenyl-phenylether	51-123	-	69
4-Nitroaniline	14-118	-	69
4,6-Dinitro-2-methylphenol	29-137	-	65
n-Nitrosodiphenylamine	52-124	-	78
4-Bromophenyl-phenylether	55-127	-	71
Hexachlorobenzene	55-127	-	70
Pentachlorophenol	13-123	76	62
Phenanthrene	54-126	-	78
Anthracene	58-124	-	77
Carbazole	44-146	-	81
Di-n-butylphthalate	50-128	-	83
Fluoranthene	48-120	-	83
Pyrene	46-124	122	78
Butylbenzylphthalate	42-132	-	83
Benzo[a]anthracene	48-120	-	80
3,3'-Dichlorobenzidine	23-123	-	57
Chrysene	47-125	-	81
bis(2-Ethylhexyl)phthalate	29-127	-	84
di-n-Octylphthalate	41-125	-	78
Benzo[b]fluoranthene	35-119	-	73
Benzo[k]fluoranthene	40-136	-	85
Benzo[a]pyrene	49-121	-	71
Indeno[1,2,3-cd]pyrene	34-130	-	75
Dibenz[a,h]anthracene	35-131	-	71
Benzo[g,h,i]perylene	29-131	-	73

TABLE 7

BLANK SPIKE RECOVERY RESULTS (PERCENT)
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Extraction Date: Control Limits	*12/16/97*
TCL Pesticides/PCBs		
alpha-BHC	37-134	101
beta-BHC	17-147	79
delta-BHC	19-140	79
gamma-BHC (Lindane)	32-127	114
Heptachlor	34-111	93
Aldrin	42-122	92
Heptachlor epoxide	37-142	95
Endosulfan I	45-153	83
Dieldrin	36-146	103
4,4'-DDE	30-145	91
Endrin	30-147	105
Endosulfan II	10-202	93
4,4'-DDD	31-141	104
Endosulfan sulfate	26-144	81
4,4'-DDT	25-160	78
Methoxychlor	58-199	114
Endrin ketone	57-166	103
Endrin aldehyde	10-128	79
alpha-Chlordane	19-150	115
gamma-Chlordane	44-144	110

TABLE 7

BLANK SPIKE RECOVERY RESULTS (PERCENT)
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

	Digestion Date: Control Limits	*06/04/96*	*06/05/96*	*06/18/96*	*05/28/97*	*07/29/97*	*01/02/98*	*12/22/97*
TAL Metals								
Aluminum	57-143	97	-	97	101	108	118	-
Antimony	65-205	97	-	96	102	104	89	-
Arsenic	74-126	105	-	95	100	110	103	-
Barium	77-123	94	-	95	94	100	104	-
Beryllium	78-122	94	-	94	98	103	101	-
Cadmium	77-123	96	-	96	102	106	103	-
Calcium	68-132	94	-	95	101	104	101	-
Chromium	80-120	95	-	95	100	101	103	-
Cobalt	80-120	95	-	95	101	105	100	-
Copper	80-120	95	-	94	99	101	102	-
Iron	52-148	93	-	94	99	104	129	-
Lead	76-124	96	-	98	103	105	105	-
Magnesium	72-128	93	-	95	101	103	104	-
Manganese	75-125	94	-	95	100	102	106	-
Mercury	64-136	-	105	99	99	104	-	96
Nickel	78-122	95	-	95	101	106	102	-
Potassium	66-134	95	-	99	98	100	101	-
Selenium	74-126	90	-	100	108	104	100	-
Silver	74-126	94	-	99	99	108	105	-
Sodium	68-133	98	-	104	97	95	100	-
Thallium	65-135	94	-	96	94	92	107	-
Vanadium	68-131	94	-	96	96	92	100	-
Zinc	77-123	95	-	95	102	104	107	-

Notes:
- Not Applicable.
BS Blank Spike.
PCBs Polychlorinated Biphenyls.
TAL Target Analyte List.
TCL Target Compound List.

TABLE 8

MATRIX SPIKE/MATRIX SPIKE DUPLICATE SUMMARY (PERCENT)
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

Parameters	*MS/MSD Control Limits*	*RPD Control Limits*	*Composite A*		
			MS	*MSD*	*RPD*
Volatiles					
Chloromethane	56-128	20	132*	136*	3
Bromomethane	60-134	20	105	106	1
Vinyl chloride	48-137	20	131	139*	6
Chloroethane	64-124	20	112	119	6
Methylene chloride	76-114	20	104	107	3
Acetone	31-171	20	112	129	14
Carbon disulfide	46-137	20	85	93	9
1,1-Dichloroethene	58-129	20	95	100	5
1,1-Dichloroethane	67-125	20	103	104	2
1,2-Dichloroethene(total)	73-115	20	120*	120*	0
2-Butanone	38-170	20	135	136	0
Chloroform	75-113	20	90	90	1
1,2-Dichloroethane	79-111	20	92	90	3
1,1,1-Trichloroethane	69-118	20	93	93	0
Carbon tetrachloride	62-124	20	85	86	2
Bromodichloromethane	80-109	20	98	93	5
1,2-Dichloropropane	80-111	20	115	110	4
cis-1,3-Dichloropropene	77-111	20	98	90	9
Trichloroethene	69-118	20	90	94	4
Benzene	73-115	20	106	101	4
Dibromochloromethane	80-109	20	98	92	6
trans-1,3-Dichloropropene	79-109	20	91	88	3
1,1,2-Trichloroethane	81-110	20	110	104	5
Bromoform	74-116	20	104	91	13
4-Methyl-2-Pentanone	68-118	20	149*	140*	6
2-Hexanone	42-169	20	142	140	1
Tetrachloroethene	59-124	20	84	93	11
1,1,2,2-Tetrachloroethane	75-116	20	116	94	21*
Toluene	71-115	20	97	103	5
Chlorobenzene	74-113	20	103	110	7
Ethylbenzene	58-149	20	89	89	0
Styrene	68-118	20	91	91	0
Xylene(total)	67-118	20	120*	127*	6

TABLE 8

MATRIX SPIKE/MATRIX SPIKE DUPLICATE SUMMARY (PERCENT)
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

Parameters	*MS/MSD Control Limits*	*RPD Control Limits*	*Composite A*		
			MS	*MSD*	*RPD*
Semi-Volatiles					
Phenol	26-90	35	77	77	0
2-Chlorophenol	25-102	50	71	74	4
1,4-Dichlorobenzene	28-104	27	67	67	0
N-Nitroso-di-n-propylamine	41-126	38	86	86	0
1,2,4-Trichlorobenzene	38-107	23	62	62	0
4-Chloro-3-methylphenol	26-103	33	68	71	4
Acenaphthene	31-137	19	71	71	0
4-Nitrophenol	11-114	50	68	65	5
2,4-Dinitrotoluene	28-89	47	62	62	0
Pentachlorophenol	17-109	47	52	42	21
Pyrene	35-142	36	76	76	0
Pesticides					
gamma-BHC (Lindane)	46-127	50	95	88	8
Heptachlor	35-130	31	86	81	6
Aldrin	34-132	43	86	80	7
Dieldrin	31-134	38	95	82	15
Endrin	42-139	45	111	11*	164*
4,4'-DDT	23-134	50	107	94	13

Notes:
* Value outside of associated control limit.
MS Matrix Spike.
MSD Matrix Spike Duplicate.
RPD Relative Percent Difference.

TABLE 9

LABORATORY DUPLICATE RESULTS
102ND STREET SOURCE MATERIALS
OCCIDENTAL CHEMICAL CORPORATION, OLIN CORPORATION
NIAGARA FALLS, NEW YORK
1996-1997

Parameter	*Units*	*Composite A*		
		Original	*Duplicate*	*RPD*
Metals				
Aluminum	mg/Kg	13000	14000	7
Antimony	mg/Kg	1.3	1.3	1
Arsenic	mg/Kg	8.0	8.2	2
Barium	mg/Kg	190	180	5
Beryllium	mg/Kg	0.73	0.70	3
Cadmium	mg/Kg	11	9.5	15
Calcium	mg/Kg	50000	49000	2
Chromium	mg/Kg	94	93	1
Cobalt	mg/Kg	9.2	9.1	1
Copper	mg/Kg	110	110	0
Iron	mg/Kg	23000	23000	0
Lead	mg/Kg	220	210	5
Magnesium	mg/Kg	16000	15000	6
Manganese	mg/Kg	360	360	0
Mercury	mg/Kg	0.99	0.90	10
Nickel	mg/Kg	48	51	6
Potassium	mg/Kg	2700	3400	23
Selenium	mg/Kg	0.49	0.35	33
Silver	mg/Kg	4.5	4.3	5
Sodium	mg/Kg	1200	1200	0
Thallium	mg/Kg	0.30	ND 0.26	*
Vanadium	mg/Kg	28	29	5
Zinc	mg/Kg	270	240	12

Notes:
* RPD cannot be calculated due to one or more non-detect value(s).
NDx Not detected at or above x.
RPD Relative Percent Difference.

APPENDIX C

IN-SITU BACKFILL DENSITY & MOISTURE TEST RESULTS

Fluor Daniel GTI

Summary Table of Storm Sewer Compaction Tests

Test #	Date	GZA #	Location	Soil Type	Water(%)	% Proctor	Pass/Fail	Corrective Measures
1	July 17	3	30 feet S. of MH#2	GI	10.9	99.9	Pass	
2	July 18	4	Near MH-2	GI	13.7	94.2	Pass	
3	July 18	5	Near MH-2	GI	9.4	95.4	Pass	
4	July 18	6	Near MH-2	GI	11.9	99.5	Pass	
5	July 19	4	150 ft S . of Buffalo Ave., 1 ft above pipe	GI	13.4	93.9	Pass	
6	July 19	5	220 ft N of River, final grade	GI	11.9	95.1	Pass	
7	July 22	1	100 ft S. of Buffalo Ave, 2-3 feet above pipe	GI	11.4	95.6	Pass	
8	July 22	2	150 ft S. of Buffalo Ave, 3-4 feet above pipe	On-site soil	12.0	95.6	Pass	
9	July26	3	100 ft east of MH#3, lift #1	Frontier	13.1	92.9	Pass	
10	July26	4	100 ft east of MH#3,lift #2	Frontier	12.8	99.2	Pass	
11	July26	5	80 ft east of MH#3, lift #3	On-site soil	18.2	92.0	Pass	
12	July26	6	Near MH#3, lift #1	On-site soil	16.2	96.4	Pass	
13	July 29	1	Between MH#3 & 4	GI	15.6	94.0	Pass	
14	July 29	9	15 ft from MH#3	On-site soil	17.6	87.8	Failed	Retested - #11, 7/29
15	July 29	10	40 ft from MH#3	On-site soil	17.8	88.6	Failed	Retested - #11, 7/29
16	July 29	11	Retest of #9	On-site soil	16.9	92.8	Pass	
17	July 29	12	Retest of #10	On-site soil	14.9	92.9	Pass	
18	July 30	5	Between MH3/4, 2nd lift	GI	13.8	97.3	Pass	
19	July 30	6	Between MH3/4, 2nd lift	GI	15.2	93.3	Pass	
20	July 30	7	Between MH3/4, 1st lift	GI	15.2	96.6	Pass	
21	July 30	8	Between MH3/4, 3rd lift	GI	15.7	97.5	Pass	
22	July 31	8	Between MH3/4	GI	21.6	72.6	Failed	Area wet, allowed to dry and reworked following week
23	July 31	9	Between MH3/5	GI	20.2	87.5	Failed	Area wet, allowed to dry and reworked following week
24	July 31	10	Between MH3/6	GI	18.2	87.5	Failed	Area wet, allowed to dry and reworked following week
25	August 2	5	Near MH#2, 1st lift	GI	10.1	103.1	Pass	
26	August 2	8	Near MH#2, 2nd lift	GI	11.7	96.8	Pass	
27	August 2	9	Near MH#3, 1st lift	GI	15.5	91.4	Pass	
28	August 2	10	Near MH#3, 2nd lift	GI	15.2	91.9	Pass	
29	August 2	11	Near MH#3, 3rd lift	GI	12.1	91.7	Pass	
30	August 5	3	Between MH#4 & 5, , 1st lift	GI	13.8	90.7	Pass	
31	August 6	4	Just east of MH-3, 1 st lift	GI	17.4	87.0	Failed	Retested - #5,8/6
32	August 6	5	Retest of #4	GI	14.3	91.2	Pass	
33	August 6	6	Just east of MH-3, 2nd lift	GI	26.2	72.9	Failed	Retested - #10,8/6
34	August 6	10	Retest of #6	GI	15.3	90.0	Pass	
35	August 6	11	Just east of MH-3, 3rd lift	GI	16.4	91.1	Pass	
36	August 6	12	Between existing MH and MH-6, 1 st lift	GI	18.2	88.6	Failed	Retested - #14,8/6
37	August 6	13	Just east of MH-3, 4th lift	GI	15.9	92.2	Pass	
38	August 6	14	Retest of #12	GI	18.1	90.7	Pass	
39	August 6	15	Just east of MH-3, 5th lift	GI	17.6	90.1	Pass	
40	August 7	2	Just NE of MH-1, 1st lift	GI	19.0	73.5	Failed	Reworked August 16 & 20
41	August 7	3	Just SE of MH-3	GI	14.1	89.1	Failed	Retested - #6 & 11, 8/7
42	August 7	4	Between existing MH and MH-6, 1st lift	GI	19.7	86.0	Failed	Retested - #4, 8/7
43	August 7	5	Retest of #2	GI	16.1	84.3	Failed	Reworked August 16 & 20
44	August 7	6	Retest of #3	GI	16.9	86.0	Failed	Retested - #11, 8/7
45	August 7	7	Retest of #4	GI	18.7	89.2	Allowed to pass	Allowed to pass after signifigant compaction
46	August 7	8	Just E of MH-1, 2 nd lift	GI	17.9	92.7	Pass	
47	August 7	9	Just E of MH-1, 3 rd lift	GI	19.5	86.6	Failed	Retested - #10, 8/7
48	August 7	10	Retest of #9	GI	19.9	90.0	Pass	
49	August 7	11	Retest of #3	GI	14.1	94.1	Pass	
50	August 7	13	30 ft east of MH-6, 1st lift	GI	18.6	84.9	Failed	Retested - #14,16,17, &18, 8/7
51	August 7	14	Retest of #13	GI	19.6	87.0	Failed	Retested - #16,17, &18, 8/7
52	August 7	15	Retest of #4	GI	15.7	90.1	Pass	
53	August 7	16	Retest of #13	GI	17.3	89.2	Failed	Retested - #17, &18, 8/7
54	August 7	17	Retest of #13	GI	18.5	88.0	Failed	Retested - #18, 8/7
55	August 7	18	Retest of #13	GI	17.2	92.6	Pass	
56	August 7	19	30 ft east of MH-6, 2nd lift	GI	18.2	87.0	Failed	Retested - #20, 8/7
57	August 7	20	Retest of #19	GI	19.3	90.3	Pass	
58	August 8	1	70 ft west of MH-6, 1st lift	GI	16.1	93.9	Pass	
59	August 8	3	40 ft west of MH-6, 2nd lift	GI	15.2	95.9	Pass	
60	August 8	4	8 ft from MH-4, 1st lift	GI	20.3	90.0	Pass	
61	August 8	5	8 ft from MH-4, 2nd lift	GI	14.3	97.3	Pass	
62	August 8	6	8 ft from MH-4, 3rd lift	GI	13.2	96.4	Pass	
63	August 9	1	Just west of MH-6, 1 st lift	Frontier	14.6	95.9	Pass	
64	August 9	2	67 ft west of MH-6, 1st lift	Frontier	14.7	92.6	Pass	
65	August 9	3	87 ft west of MH-6, 2nd lift	Frontier	11.6	105.0	Pass	
66	August 9	6	107 ft west of MH-6, 3rd lift	Frontier	13.5	98.2	Pass	
67	August 12	3	10 ft west of MH-6, 1st lift	GI	16.6	88.0	Failed	Retested - #5, 8/12
68	August 12	4	5 ft east of MH-7, 1st lift	GI	11.4	94.8	Pass	
69	August 12	5	Retest of #3	GI	15.3	91.1	Pass	
70	August 12	6	8 ft North of MH-2, 1 st lift	GI	14.3	94.4	Pass	
71	August 12	7	Near MH-7, 2 nd lift	GI	13.8	94.2	Pass	
72	August 12	12	75 ft west of MH-7, 3rd lift	GI	16.3	90.1	Pass	
73	August 12	13	50 ft west of MH-7, 4th lift	GI	15.8	90	Pass	
74	August 12	14	20 ft west of MH-7, 5th lift	GI	16.5	91.4	Pass	
75	August 13	1	10 ft west of MH-2, 1st lift	GI	13.4	95.3	Pass	
76	August 13	2	140 ft west of MH-7, 1st lift	GI	19.8	81.6	Failed	Retested - #3, 8/14
77	August 13	3	10 ft southeast of MH-3, 1st lift	GI	14.1	98.9	Pass	
78	August 13	4	6 ft east of MH-4, 1st lift	GI	16.8	88.2	Failed	Retested - #5, 8/13
79	August 13	5	Retest of #4	GI	17.6	90.5	Pass	
80	August 14	1	20 west of MH-4, 1st lift	GI	11.6	16.8	Pass	
81	August 14	2	75 ft south of MH-3, 1st lift	GI	15.3	94.9	Pass	
82	August 14	3	?	GI	15.6	91.2	Pass	
83	August 14	4	100 ft east of MH-4	GI	15.4	98.1	Pass	
84	August 15	4	17 ft west of MH-3, 1st lift	GI	13.1	95.5	Pass	
85	August 15	6	10 ft west of MH-4,1st lift	Frontier	14.0	97.8	Pass	
86	August 15	8	50 ft west of MH-5, 1st lift	Frontier	13.9	94.5	Pass	
87	August 15	9	45 ft east of MH-7, 1st lift	Frontier	13.7	90.1	Pass	
88	August 15	10	35 ft west of MH-5, 2nd lift	Frontier	11.5	100.8	Pass	
89	August 16	1	25 ft east of MH-7,1st lift	Frontier	14.8	97.0	Pass	
90	August 16	2	6 ft west of existing MH, 1st lift	Frontier	12.8	104.6	Pass	
91	August 16	3	10 ft west of MH-6, 1 st lift	Frontier	12.9	103.1	Pass	

Fluor Daniel GTI

Summary Table of Storm Sewer Compaction Tests

Test #	Date	GZA #	Location	Soil Type	Water(%)	% Proctor	Pass/Fail	Corrective Measures
92	August 16	4	25 ft west of MH-5, 1st lift	Frontier	12.6	101.0	Pass	
93	August 16	7	25 ft east of MH-5, 1 st lift	Frontier	14.5	98.0	Pass	
94	August 16	9	4 ft east of MH-1, 1st lift	Frontier	12.3	102.8	Pass	
95	August 16	11	40 ft east of MH-9, 1st lift	Frontier	15.7	92.5	Pass	
96	August 19	1	70 ft west of MH-9, 1st lift	GI	16.5	86.0	Failed	Retested - #1, 8/19
97	August 19	2	Retest of #1	GI	13.7	97.1	Pass	
98	August 19	3	1 ft south of MH-9, 1st lift	GI	16.2	92.3	Pass	
99	August 19	4	1 ft south of MH-7, 1st lift	GI	10.6	91.4	Pass	
100	August 19	5	1 ft south of MH-6, 1st lift	GI	11.1	102.6	Pass	
101	August 19	7	40 ft west of MH-9, 2nd lift	GI	13.0	94.7	Pass	
102	August 20	1	7 ft east of MH-5, 1st lift	GI	10.4	90.6	Pass	
103	August 20	3	30 ft west of MH-9,1 st lift	GI	13.8	96.5	Pass	
104	August 20	4	15 ft east of MH-5, 2nd lift	GI	10.9	91.5	Pass	
105	August 20	5	1 ft west of MH-1, 1st lift	GI	7.9	99.8	Failed	Retested - #7, 8/20
106	August 20	6	45 ft west of MH-10, 1st lift	GI	14.4	90.6	Pass	
107	August 20	7	1 ft west of MH-10, 1st lift	GI	10.3	93.9	Pass	
108	August 20	8	36 ft east of MH-11, 1st lift	GI	9.6	96.9	Pass	
109	August 26	1	Just west of MH-5, 1st lift	GI	10.6	100.9	Pass	
110	August 26	2	Just south of MH-5, 2nd lift	GI	15.9	89.6	Failed	Retested - #2, 8/26
111	August 26	3	Retest of #2	GI	14.9	90.0	Pass	
112	August 26	4	South of MH-5, 3rd lift	GI	12.2	90.9	Pass	
113	August 26	5	South of MH-5, 4th lift	GI	15.9	90.2	Pass	
114	August 26	6	South of MH-5, 5th lift	GI	14.9	90.0	Pass	
115	August 26	7	South of MH-5, 6th lift	GI	16.0	91.8	Pass	
116	August 26	8	South of MH-5, 7th lift	GI	15.2	93.2	Pass	
117	August 26	9	South of MH-5, 8th lift	GI	16.2	91.5	Pass	
118	August 26	10	South of MH-5, 9th lift	GI	16.3	91.8	Pass	
119	August 26	12	South of MH-5, 10th lift	GI	15.2	93.4	Pass	
120	August 26	13	South of MH-5, 11th lift	GI	15.8	90.0	Pass	
121	August 26	14	South of MH-5, 12th lift	GI	15.6	92.4	Pass	

DAILY FIELD SUMMARY

DATE 7/17/96 FILE No. 55099

REPORT No. DFS-28 SHEET 1 of 4

PROJECT 102nd Street Landfill Site LOCATION Niagara Falls, New York

OWNER Oxy Chem / OLin CONTRACTOR Smith Environmental / Tech In

WEATHER CONDITIONS Clear; temp 70 to 85°F; wind light

REMARKS

REPORT

9⁰⁰ Left the office

9³⁰ Arrive at site.

Met with P. Porter

Standardize Troxler Moisture/Density Gauge (SN 20803)

MS 641 -1.6 %
DS 2658 -0.3 % } ✓ OK

Made in-place moisture density tests on perimeter soils in North east part of site. See attached location sketch and summary of results.

3³⁰ Left Site Lunch (1hr)

4⁰⁰ End day

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See attached Daily Accounting Summary

GZA

Gary Klawinski
PREPARED BY

REPORT No. DFS-28.1

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill Rem
Location Niagara Falls, NY
Contractor Smith Environmental Tech Corp

Date 7/1/96
File No. 55099
Technician G. Klawinski

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	North east part of site perimeter soils. See location plan	1st 1.ft today	120.2	12.8	C	102.1	12	% M from opt
2	11	2nd 1.ft today	115.3	10.3	C	98.0	12	% M from opt
3	Along storm line backfill. 30ft south of manhole along east side pipe at elev of about top of pipe	—	117.6	10.9	C	99.9	12	% M from opt
4	North east part of site perimeter soils.	1st 1.ft	119.6	9.9	C	101.5	6	-3.7 % M from opt
5	11	2nd 1.ft	110.8	12.4	C	94.1	8	% M from opt
6	11	1st 1.ft	106.5	11.4	C	90.5	8	% M from opt
7								% M from opt
8								% M from opt
9								% M from opt
10								% M from opt
								% M from opt

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF) (1)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
A	113.5	15.0	Love Canal Material
B	108.5	19.0	DCF Material
C	117.7	13.6	Grand Island Material

REMARKS: (1) Standard Proctor

DAILY FIELD SUMMARY

DATE 7/18/96 FILE No. 55099

REPORT No. DFS-29 SHEET 1 of 4

PROJECT 102nd Street Landfill Site LOCATION Niagara Falls, New York

OWNER Oxy Chem/Olin CONTRACTOR Smith Environmental/Tech In

WEATHER CONDITIONS Overcast; temp 70 to 80 °F; wind light

REMARKS

REPORT

9⁰⁰ Left office

9³⁰ Arrive at site.

Standard Proctor moisture/density gauge (SN 20903)

MS 645 -0.2% }
DS 2658 -0.2% } ✓ OK

Made in-place moisture density tests on permitted soils at North side of site. See location sketch for details.

Collect bag sample of the following materials

07186-1 No 1 Stone from along storm sewer line about 100 ft south of road.

07186-2 Frontier Stone Material from east end of Cofferdam. Near final elevation.

11³⁰ Left site

12⁰⁰ Arrive office

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time
} See attached Daily Accounting Summary

GZA

Gary Klawinski
PREPARED BY

Report No. DFS-29

Page 2 of 4

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill Rem
Location Niagara Falls, NY
Contractor Smith Environmental Tech Corp

Date 7/11/96
File No. 55099
Technician G. Klawinski

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	North side of site perimeter soils	3rd lift	126.6	9.9	C	107.6	12	% M from opt
2	"	2nd lift	120.5	10.7	C	102.4	12	% M from opt
3	"	1st lift	107.7	10.9	C	91.5	8	% M from opt
4	Along storm sewer backfill.	At top pipe	110.9	13.7	C	94.2	8	% M from opt
5	"	"	112.3	9.4	C	95.4	8	% M from opt
6	"	"	117.1	11.9	C	99.5	12	% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF) (1)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
A	113.5	15.0	Love Canal Material
B	108.5	19.0	DCF Material
C	117.7	13.6	Grand Island Material

REMARKS: (1) Standard Proctor

DAILY FIELD SUMMARY

DATE 7/19/96 FILE No. 55099

REPORT No. DFS-30 SHEET 1 of 4

PROJECT 102 nd Street Landfill Site LOCATION Niagara Falls, New York

OWNER Oxy Chem / Olin CONTRACTOR Smith Environmental / Tech Ec

WEATHER CONDITIONS Overcast ; temp 70 to 80°F ; high wind

REMARKS

REPORT

12[00] Left the office

12[30] Arrive at site.

Standardize Troxler moisture / density gauge (SN 20803)

MS 653 1.3 %
DS 2671 0.4 % ✓

Made in-place moisture / density tests on north side of site perimeter soils.

2[30] Left the site

3[00] End day

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See attached Daily Accounting Summary

GZA

Gary Klawinski
PREPARED BY

Report No. DFS-30

Page 2 of 2

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill Rem
Location Niagara Falls, NY
Contractor Smith Environmental Tech Corp

Date 7/19/96
File No. 55099
Technician G. Klawinski

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	North side of site perimeter soils. See location plan	1st 1 ft	115.0	10.7	C	97.7	8	% M from opt
2	"	2nd 1 ft	122.0	10.6	C	103.7	8	% M from opt
3	"	3rd 1 ft	115.4	12.3	C	98.1	8	% M from opt
4	West side of storm sewer line, ~150 ft South of Buffalo Ave.	About 1 ft above topsoil	110.5	13.4	C	93.9	12	% M from opt
5	" ~200 ft North of river	Near Final Grade	111.9	11.9	C	95.1	12	% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF) (1)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
A	113.5	15.0	Love Canal Material
B	108.5	19.0	DCF Material
C	117.7	13.6	Grand Island Material

REMARKS: (1) Standard Proctor

DAILY FIELD SUMMARY

DATE 7/22/96 FILE No. 55099

REPORT No. DFS-31 SHEET 1 of 4

PROJECT 102nd Street Landfill Site LOCATION Niagara Falls, New York

OWNER Oxy Chem / Olin CONTRACTOR Smith Environmental / Tech I.

WEATHER CONDITIONS Clear; temp 70 to 80°F; wind light

REMARKS

REPORT

9[15] Left the office

945 Arrive at site

Standardize Troxler moisture/density gauge SN 20803

MS = 648 0.2 % } ok
DS = 2660 0 % }

Made in-place moisture/density tests on north side of site perimeter soils. See location sketch and summary of results.

11[30] - 12[30] Lunch

1[00] Left the site, Traveling my car.

1[30] Arrive at Fraction Stone with Smith.

Collect two samples of rip-rap material

07226-1 < 3 inch size material from surge pile

07226-2 < 3 inch size material from Bird Island pile

2[00] Left the Fraction site

2[30] Arrive at office

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See attached Daily Accounting Summary

GZA

Gary Klawinski
PREPARED BY

Report No. DFS-31

Page 2 of 4

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill Rem
Location Niagara Falls, NY
Contractor Smith Environmental Tech Corp

Date 7/22/96
File No. 55099
Technician G. Klawinski

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm sewer line backfill. About 100 ft south of Buffalo Ave.	2 to 3 ft above top pipe	112.6	11.4	C	95.6	10	% M from opt
2	" About 145 ft south of Buffalo Ave	3 to 4 ft above top pipe	111.8	12.0	On site Natural Soils	—	6	% M from opt
3	North side Perimeter Soils See location sketch	1st 1 ft	106.2	13.9	C	90.2	6	% M from opt
4	"	2-3 1 ft	114.6	13.9	C	97.4	8	% M from opt
5	"	3-4 1 ft	115.2	14.0	C	97.8	8	% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF) (1)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
A	113.5	15.0	Love Canal Material
B	108.5	19.0	DCF Material
C	117.7	13.6	Grand Island Material

REMARKS: (1) Standard Proctor

DAILY FIELD SUMMARY

DATE 7/26/96 FILE No. 55099

REPORT No. DFS-35 SHEET 1 of 7

PROJECT 102ND ST LANDFILL REMED. LOCATION NIAGARA FALLS, N.Y.

OWNER OXY CHEM / OLIN CONTRACTOR SMITH ENVIRONMENTAL

WEATHER CONDITIONS SUNNY TO PARTLY CLOUDY, 70°S

REMARKS SITE IS GENERALLY DRY

REPORT

7:00 AM - ARRIVED ON SITE

STANDARDIZED TROXLER MOISTURE / DENSITY GAUGE
GAUGE S/N 20803
DS-2674 (VAR. 0.2%) MS-646 (VAR - 0.6%)

PERFORMED FIELD SOIL TESTS (IN PLACE DENSITY/MOISTURE; POCKET PENETROMETER, TORVANE) ON FRONTIER STONE MATERIAL PLACED FOR COFFERDAM, AS REQUESTED BY SMITH ENVIRONMENTAL. TEST WERE TAKEN AT TWO TEST PITS DUG INTO COFFERDAM. SEE SHEETS 2 AND 3 FOR TEST LOCATIONS AND TEST DATA.

PERFORMED IN-PLACE DENSITY/MOISTURE TESTS FOR PERIMETER SOIL BACKFILL AND STORMWATER DRAINAGE SYSTEM BACKFILL PLACED ALONG BUFFALO AVE. BY ARMAND CONSTRUCTION, INC. SEE SHEETS 4 AND 5 FOR TEST LOCATIONS AND SHEET 6 FOR TEST RESULTS.

MONITORED CONCRETE PLACEMENT FOR PIPE CONNECTION WITH STORM DRAIN MANHOLE MH-3.

- CONCRETE SUPPLIER: EMPIRE BUILDERS SUPPLY INC. - TRUCK 108
- CONCRETE MIX: 4000 PSI MIX NO. 67 AE w/ ASH
- TIME BATCHED: 12:30
- TIME ON SITE: 12:50
- TIME OF PLACEMENT: 12:55 - 1:45
- NO. C.Y.'S PLACED: < 1 C.Y.
- SLUMP: 2 1/2 INCHES MEASURED BY GZA
- PREPARED 3 CYLINDERS (C-4, C-5 & C-6) FOR STRENGTH TESTING

4:15 PM LEAVE SITE FOR GZA OFFICE

Field Time 8.75 HRS
Travel Time 0.5 HRS
Office Time ____
Total Time 9.25 HRS

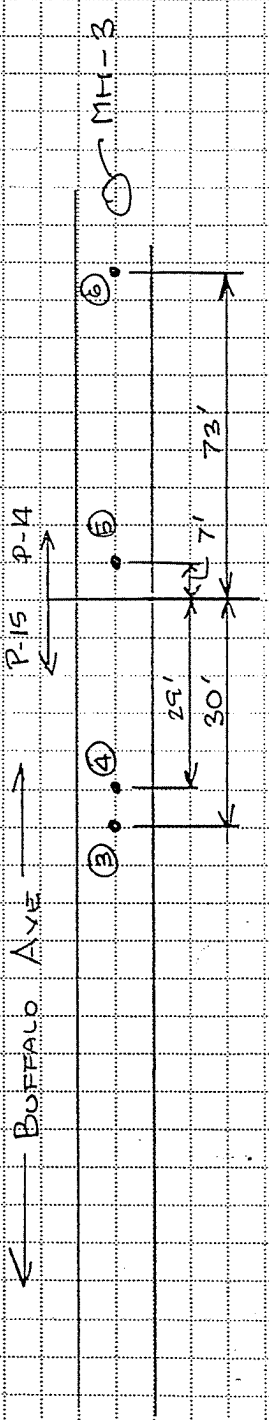
GZA

JOHN J. DANZER, P.E.
PREPARED BY

GZA GeoEnvironmental of New York
Engineers and Scientists

Project	102nd Street Remediation			File No.	55099
Location	Niagara Falls, N.Y.	Date	7/26/96	By	J. Danzer
Subject		Checked		By	
Based on		Revised		By	

Test Pit Locations
Storm Sewer Excavation
Backfill Around Buffalo Ave



REPORT No. DFS-35

IN-PLACE DENSITY TEST RESULTS

PROJECT 102ND STREET LANDFILL REMEDIATION
LOCATION NIAGARA FALLS, N.Y.
CONTRACTOR SMITH ENVIRONMENTAL TECHNOLOGIES, CORP

DATE 7/26/96
FILE No. 55099
TECHNICIAN J. DANZER

TEST NO.	TEST LOCATION DESCRIPTION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	REMARKS
1	PERIMETER SOIL EXCAVATION BACKFILL ALONG BUFFALO AVE.	1ST LIFT	115.2	12.9	C	97.9	WITHIN 0.7% OF OPT MOISTURE
2	PERIMETER SOIL EXCAVATION BACKFILL ALONG BUFFALO AVE	2ND LIFT	119.3	12.2	C	100+	WITHIN 1.4% OF OPT MOISTURE
3	STORM SEWER TRENCH BACKFILL ALONG BUFFALO AVE	1ST LIFT	109.4	13.1	C	92.9	SOIL BACKFILL APPEARS SIMILAR TO GRAND ISLAND MATERIAL
4	STORM SEWER TRENCH BACKFILL ALONG BUFFALO AVE.	2ND LIFT	116.7	12.8	C	99.2	" " "
5	STORM SEWER TRENCH BACKFILL ALONG BUFFALO AVE	3RD LIFT	104.5	18.2	A	92.0	SOIL BACKFILL APPEARS SIMILAR TO LOVE CANAL CLAY
6	STORM SEWER TRENCH BACKFILL ALONG BUFFALO AVE	1ST LIFT	109.4	16.2	A	96.4	" " "
7	PERIMETER SOIL EXCAVATION BACKFILL ALONG BUFFALO AVE.	1ST LIFT	106.0	16.2	D	92.6	WITHIN 1.2% OF OPT MOISTURE
8	PERIMETER SOIL EXCAVATION BACKFILL ALONG BUFFALO AVE	2ND LIFT	116.9	12.1	D	100+	WITHIN 2.9% OF OPT MOISTURE

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
A	113.5	15.0	LOVE CANAL CLAY
C	117.7	13.6	GRAND ISLAND MATERIAL
D	114.5	15.0	FRONTIER STONE BORROW MATERIAL

GZA

REMARKS

DAILY FIELD SUMMARY

DATE 7/29/96 FILE No. 55099

REPORT No. DFS-36 SHEET 1 of 6

PROJECT 102nd Street Landfill Site LOCATION Niagara Falls, New York

OWNER Oxy Chem / OLin CONTRACTOR Smith Environmental / Tech In

WEATHER CONDITIONS Clear; temp 70 to 80°F; wind light

REMARKS

REPORT

9^00 Left the office

9^30 Arrive at site.

Met with P. Porter.

Standardize Troxler moisture / density gauge. SN 20803

MS = 645 -0.5% } OK
DS = 2645 -0.9% }

Made in-place density tests on perimeter soils and storm sewer backfill. See attached summary of data and location sketch.

12^00 Lunch (30 min)

3^00 Left the site

4^00 End of day

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See attached Daily Accounting Summary

GZA

Gary Klawinski
PREPARED BY

Report No. DFS-36

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill Rem
Location Niagara Falls, NY
Contractor Smith Environmental Tech Corp

Date 7/29/96
File No. 55099
Technician G. Klawinski

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm Sewer Backfill along Buffalo Ave. See location sketch	1st lift today	110.7	15.6	C	94.0	8	+2.0 % M from opt
2	Perimeter Soils along the North side of the site.	1st lift above waste	108.1	11.5	C	91.8	8	-2.1 % M from opt
3	"	"	112.5	11.8	C	95.6	8	-1.8 % M from opt
4	"	2nd lift today	107.1	12.7	C	91.0	8	-0.9 % M from opt
5	"	2nd lift	96.4	14.8	C	81.9	8	Test failed — % M from opt
6	Retest of 5.	"	108.6	12.8	C	92.3	8	-0.8 % M from opt
7	Perimeter soils along north side of site.	3rd lift	108.1	13.6	C	91.8	8	0 % M from opt
8	"	4th lift	107.1	14.9	C	90.1	8	+0.7 % M from opt
9	Storm sewer backfill. About 15 South west of Manhole # 3.	—	107.4	17.6	C (2)	87.8	8	— % M from opt
10	" About 50 foot South west of manhole # 3	—	104.3	17.8	C (2)	88.6	8	— % M from opt
11	Retest of No 9	—	109.2	16.9	C (2)	92.8	12	— % M from opt

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF) (1)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
A	113.5	15.0	Love Canal Material
B	108.5	19.0	DCF Material
C	117.7	13.6	Grand Island Material

REMARKS: (1) Standard Proctor
(2) Natural soils similar to Grand Island Material

REPORT No. DFS-36

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill Rem
Location Niagara Falls, NY
Contractor Smith Environmental Tech Corp

Date 7/09/96
File No. 55099
Technician G. Klawinski

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
12	Retest of No 10	–	109.4	14.9	C (2)	92.9	12	– % M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt
								% M from opt

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF) (1)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
A	113.5	15.0	Love Canal Material
B	108.5	19.0	DCF Material
C	117.7	13.6	Grand Island Material

REMARKS: (1) Standard Proctor

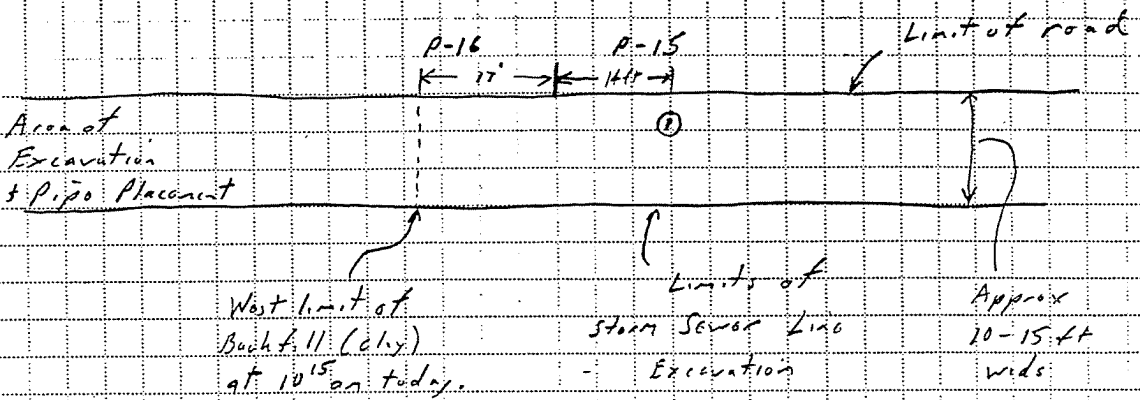
GZA GeoEnvironmental of New York
Engineers and Scientists

Report No. DFS-36

Project 102nd Street Landfill Site — File No. 55099
Location Niagara Falls, New York — Date 7/29/96 — By G. Klawinski
Subject — Checked — By
Based on — Revised — By

N

In-place Density Test Location Sketch for Storm Sewer Line Backfill.



DAILY FIELD SUMMARY

DATE 7/30/96 FILE No. 55099

REPORT No. DFS-37 SHEET 1 of 4

PROJECT 102nd Street Landfill Site LOCATION Niagara Falls, New York

OWNER Oxy Chem / Olin CONTRACTOR Smith Environmental / Tech In

WEATHER CONDITIONS Heavy rain last night; overcast; temp 70 to 85°F; wind moderate.

REMARKS

REPORT

11⁰⁰ Left the office

11³⁰ Arrive at site

Met with P. Porter.

Standardize Troxler moisture / density gauge SN 20803

MS = 649 0.3 % } OK
DS = 2664 -0.1 % }

2⁰⁰ Leave the site.

2³⁰ Arrive at office.

Lean concrete will be poured at about 2³⁰ pm today in Manhole No 3 according to the contractor. No testing required by GZA.

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See attached Daily Accounting Summary

GZA

Gary Klawinski
PREPARED BY

Report No. DFS-37
Page 2 of 4

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill Ram
Location Niagara Falls, NY
Contractor Smith Environmental Tech Corp

Date 7/30/96
File No. 55099
Technician G. Klawinski.

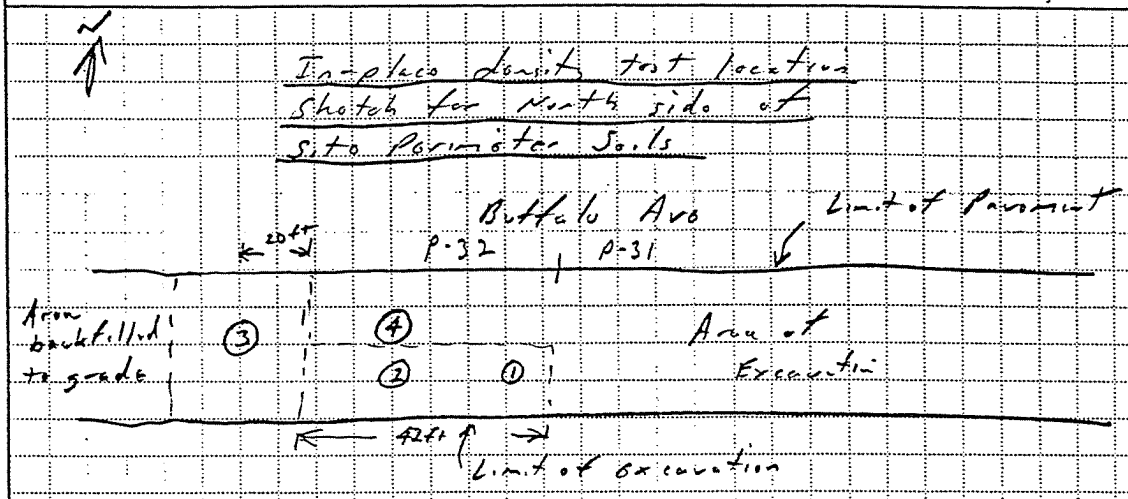
TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	North side of site perimeter soils. See location sketch	1st lift today	106.6	15.8	C	90.8	12	+2.2 % M from opt
2	"	2nd lift today	110.6	13.9	C	93.9	12	+0.3 % M from opt
3	"	1st lift today	108.7	15.3	C	92.3	8	+1.7 % M from opt
4	"	2nd lift today	106.6	12.1	C	90.6	8	-1.2 % M from opt
5	storm sewer backfill along Buffalo Ave. See location sketch	2nd lift today	114.5	13.8	C	97.3	12	+0.2 % M from opt
6	"	"	109.8	15.2	C	93.3	12	+1.6 % M from opt
7	"	1st lift today	113.7	15.2	C	96.6	12	Excavated down to 1st lift +1.6 % M from opt
8	"	3-1 lift	114.8	15.7	C	97.5	8	+2.1 % M from opt
								% M from opt
								% M from opt
								% M from opt

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF) (1)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
A	113.5	15.0	Love Canal Material
B	108.5	19.0	DCF Material
C	117.7	13.6	Grand Island Material

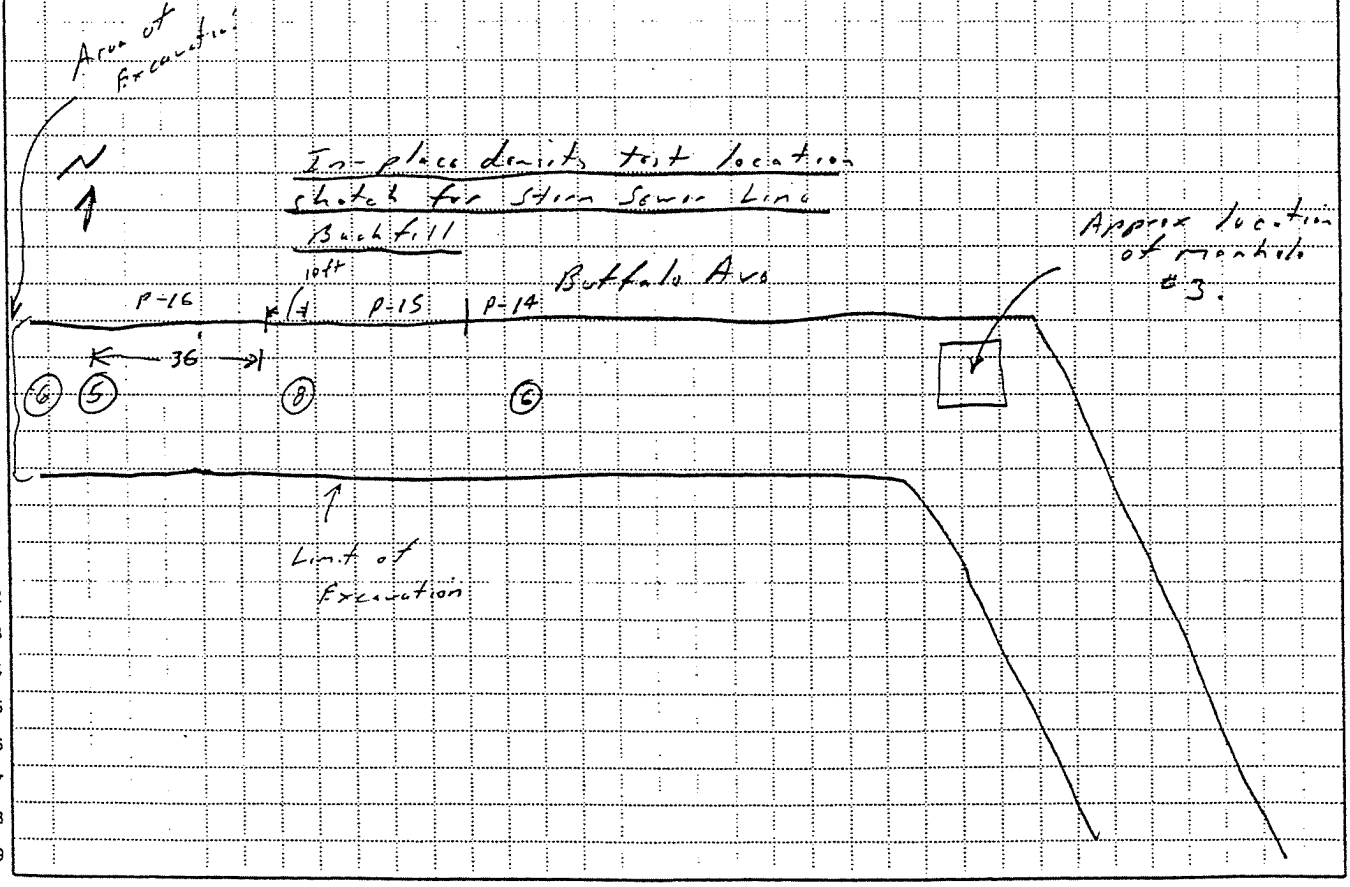
REMARKS: (1) Standard Proctor

Project 102nd Street Landfill Site — File No. 55099
Location Niagara Falls, New York — Date 7/30/96 — By G. Klawinski
Subject — Checked — By
Based on — Revised — By

In-place density test location sketch for North side of site Perimeter Soils



In-place density test location sketch for Storm Sewer Line Backfill



DAILY FIELD SUMMARY

DATE 7/31/96 FILE No. 55099

REPORT No. DFS-38 SHEET 1 of 4

PROJECT 102nd Street Landfill Site LOCATION Niagara Falls, New York

OWNER Oxy Chem / Olin CONTRACTOR Smith Environmental / Tech In

WEATHER CONDITIONS rain last night; overcast; temp 70 to 80°F; wind light

REMARKS

REPORT

10[00] Left the office.

10[30] Arrive at site.

Standardize Troxler moisture/density gauge (SN 20803)

MS = 640 -1.2% } OK
DS = 2668 0.3% }

Made in-place moisture density tests on perimeter soils along the north side of the site in backfill material west of manhole 4 and on berm along the south side of the site. See attached density test data sheet and location sketch.

12[00] Lunch (30 min)

5[00] Left Site

5[30] End day

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See attached Daily Accounting Summary

GZA

Gary Klawinski
PREPARED BY

REPORT No. DFS-38

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill Rem
Location Niagara Falls, NY
Contractor Smith Environmental Tech Corp

Date 7/31/96
File No. 55099
Technician G. Klawinski

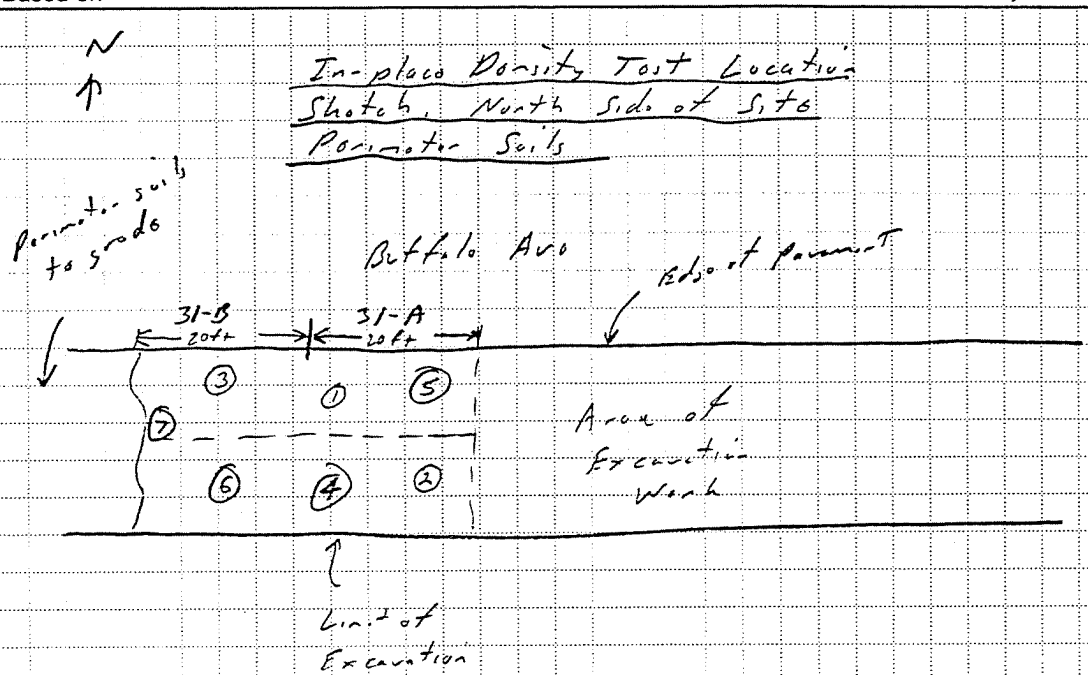
TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	North side of site perimeter Soils; See location plan	1st 1.ft	107.8	15.0	C	91.6	6	+1.4 % M from opt
2	"	1st 1.ft	110.9	15.0	C	94.2	6	+1.4 % M from opt
3	"	2nd 1.ft	108.2	14.1	C	91.9	8	% M from opt
4	"	"	107.8	14.6	C	91.6	8	% M from opt
5	"	3rd 1.ft	109.5	14.4	C	93.0	8	% M from opt
6	"	3rd 1.ft	109.0	14.9	C	92.6	8	% M from opt
7	"	4th 1.ft	110.8	13.7	C	94.1	8	% M from opt
8	North side of site storm Sewer Backfill	~8" below pavement	85.5	21.6	C	72.6	8	material removed. % M from opt
9	"	3rd 1.ft	103.0	20.2	C	87.5	12	material removed % M from opt
10	"	1st 1.ft	103.0	18.2	C	87.5	8	material removed. % M from opt
11	South side of site berm	1st 1.ft	112.0	13.6	B	103.3	12	% M from opt
			103.0	20.5		95.0	8	

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF) (1)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
A	113.5	15.0	Love Canal Material
B	108.5	19.0	DCF Material
C	117.7	13.6	Grand Island Material

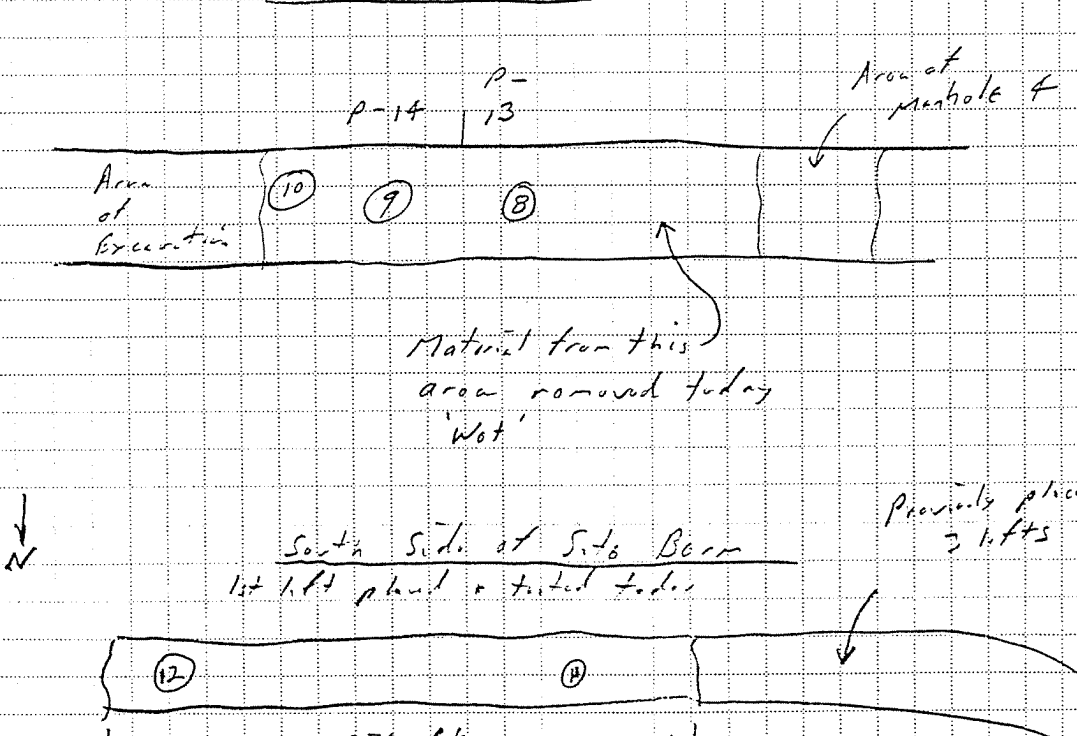
REMARKS: (1) Standard Proctor

Project 102nd Street Landfill Site — File No. 55099
Location — Date 7/31/96 — By GJM
Subject — Checked — By
Based on — Revised — By

In-place Density Test Location Sketch, North Side of Site Perimeter Soils



In-place Density Test Location Sketch, North side of site Storm Sewer Backfill



DAILY FIELD SUMMARY

DATE 8/2/96 FILE No. 55099

REPORT No. DFS-40 SHEET 1 of 5

PROJECT 102nd street Landfill Site LOCATION Niagara Falls, NY

OWNER OxyChem / Olin CONTRACTOR Smith Environmental Tech Inc

WEATHER CONDITIONS clear ; temp 70-80°F ; wind light. Heavy rain last night

REMARKS

REPORT

9[15] Left office

9[45] Arrive at site

Met with P. Proctor

Standardize Troxler moisture/density gauge SN 20803

MS 650	0.6	} Ok
DS 2672	0.4	

Made in-place density tests on north side of site perimeter soils and storm sewer backfill near manholes No 2 and No 3. See attached data sheet and location sketch.

12[00] Lunch 30 min

5[00] Left the site

5[30] End day

REVIEWED BY :
JOHN J. DANZER, P.E.

Field Time ____
Travel Time ____
Office Time ____
Total Time ____

} See attached Daily Accounting Summary

GZA

Gary Klawinski
PREPARED BY

Report No. DFS-40

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/2/96
File No. 55099
Technician GJH

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	North side of site perimeter soils. See location sketch	1st lift	115.6	12.1	C	98.2	8	Lower area
2	"	1st lift	121.5	10.3	C	103.2	8	Upper area
3	"	2nd lift	111.9	12.6	C	95.1	8	Lower area
4	"	"	116.4	12.0	C	98.9	8	Upper area
5	Near manhole #2	1st lift today	121.3	10.1	C	103.1	8	
6	North side of site perimeter Soils	3rd lift	115.2	12.1	C	97.8	8	Both areas at same elev
7	"	4th lift	107.8	14.3	C	91.6	8	"
8	Near manhole # 2	2nd lift today	113.9	11.7	C	96.8	8	
9	Near manhole # 3	1st lift today	107.6	15.5	C	91.4	8	
10	"	2nd lift today	108.1	15.2	C	91.9	8	
11	"	3rd lift	107.9	12.1	C	91.7	8	

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
C	117.7	13.6	Grand Island material

REMARKS:

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/2/96
File No. 55094
Technician G.F.H.

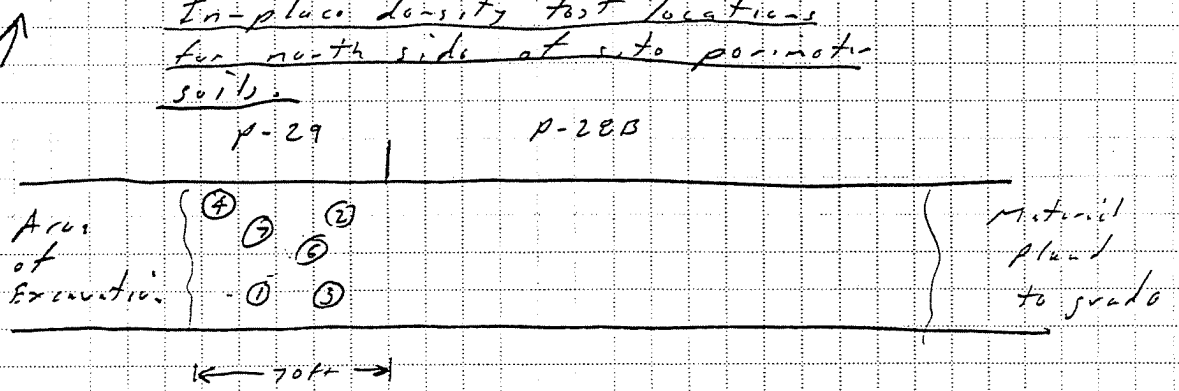
TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
12	D Coll cover material. 50 west of east end of coll. Top center	1.1 ft 1.1 ft	111.5	14.6	A	98.3	6	

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
A	113.5	15.0	Love Canal Soil

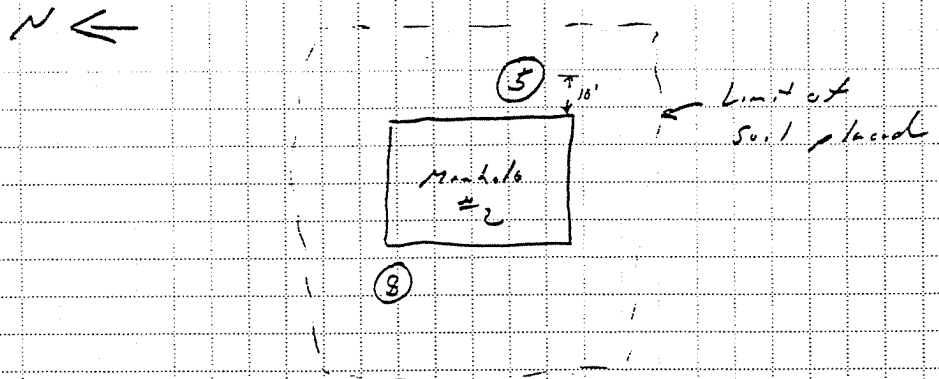
REMARKS:

Project 102nd Street Landfill — File No. 55099
Location — Date 8/2/97 — By GJH
Subject — Checked — By
Based on — Revised — By

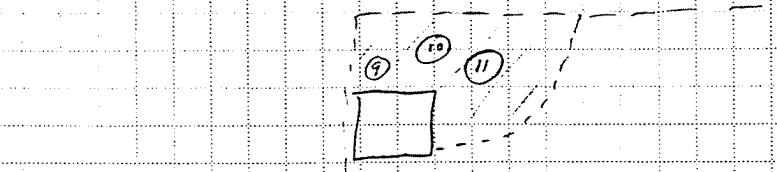
In-place density test locations for north side of site perimeter soils.



In-place density test locations at Manhole No 2



In-place density test location at manhole 3



DAILY FIELD SUMMARY

DATE 8/5/96 FILE No. 55099

REPORT No. DFS-41 SHEET 1 of 5

PROJECT 102nd Street LOCATION Niagara Falls, NY

OWNER Oxy / Olin CONTRACTOR Smith Env Tech

WEATHER CONDITIONS clear; temp 70 to 90°F; wind light

REMARKS

REPORT

7^30 Left the office. Pick up Torvane and bentonite pellets.

8^00 Arrive at site.

Standardize Troxler moisture/density gauge (SN 20803).

Moisture Standard Count 646 (-0.2 % var) } OK
Density Standard Count 2649 (-0.7 % var) }

Made in-place density / moisture tests on perimeter soils and storm sewer line backfill. See attached in-place density test results and location sketch.

Contractor hauling and placing Frontier stone material (Bulkhead Soil) along south side of site. First lift placed and compacted. No testing done by GZA on first lift as requested by Smith.

According to Smith 27,395 Tons of Frontier Stone Soils were placed in the cofferdam. Gap area is remaining.

Concrete Placement at Manhole # 1 and # 3 (one batch)
Supplier: Empire Builders Supply
Truck No: 128
Batch Time: Not on ticket (2yds)
Placement Time: 2^00 - 2^40 pm
Mix No: 67
GZA Measured Slump: 5 inches
Water added to batch: 4 gal
* See attached ticket for additional info.
3 cylinders collected, Set No 4, C-10, C-11, C-12

Field Time
Travel Time
Office Time
Total Time

} See attached accounting summary

GZA

Gary Klawinski
PREPARED BY

DAILY FIELD SUMMARY

DATE 8/5/96 FILE No. 55099

REPORT No. DFS-41 SHEET 2 of 8

PROJECT 102 nd Street LOCATION Niagara Falls, NY

OWNER Oxy / Olin CONTRACTOR Smith Env Tech

WEATHER CONDITIONS See sheet 1

REMARKS

REPORT

Concrete Placement at Existing Manhole # 3

Supplier: Empire Builders Supply
Truck No: 118
Batch Time: 3^35 pm
Placement Time: 4^00 - 4^10 pm
Mix No: 67
GZA Measured Slump: 3.5 inches
Water added to batch: No
* See attached ticket for additional info.

* No cylinders taken as requested by Oxy / Smith

Made in-place density / moisture tests on Frontier Stone Material at Bulkhead area on south west corner of site. See attached results and location sketch.

5^00 Left the site.

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

GZA

Gary Klawinski
PREPARED BY

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/15/96
File No. 55099
Technician GJK

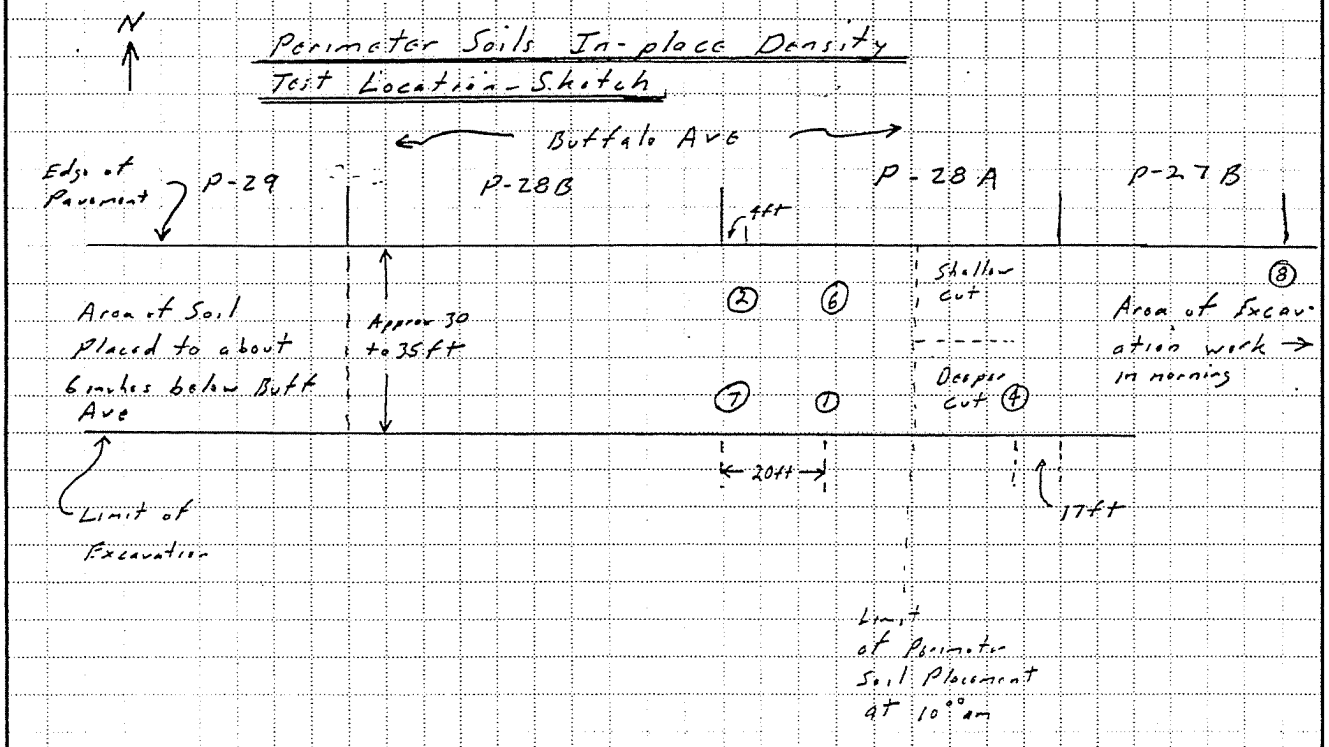
TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Perimeter Soils; North side of site; See location sketch.	1st lift today	110.0	18.6	C	93.4	8	Lift is about 3.3 ft below Buff Ave
2	"	1st lift today	107.5	19.8	C	91.3	8	Lift is about 6 inches below Buff Ave
3	Storm Sewer P.P. Backfill; Between Manhole No 4 and No 5	1st lift today	106.7	13.8	C	90.7	8	Lift is about 6 inches below Buff Ave
4	Perimeter Soils; North side of site; See location sketch	2nd lift today	110.4	14.1	C	93.8	8	Lift is about 1.5 ft below Buff Ave
5	South side of site bulk head material. See location sketch	2nd lift today	113.0	13.8	D	98.7	8	Note: 1st lift not tested. Torvane = 0.45 x 2.5 = 1.13 kg/cm^2
6	Perimeter Soils; North side of site: See location plan	3rd lift today	108.6	14.2	C	92.3	8	Lift is about level with Buff Ave
7	"	"	108.1	15.3	C	91.8	8	Lift is about 6 inches below Buff Ave
8	"	4th lift today	107.5	14.5	C	91.3	8	Lift is about 1 ft below Buff Ave
9	South side of site bulk head material. See location sketch	3rd lift today	115.0	13.9	D	100.4	8	Torvane = 0.45 x 2.5 = 1.13 kg/cm^2

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
D	114.5	15.0	Frontier Stone
C	117.7	13.6	Grand Island Material (clay)

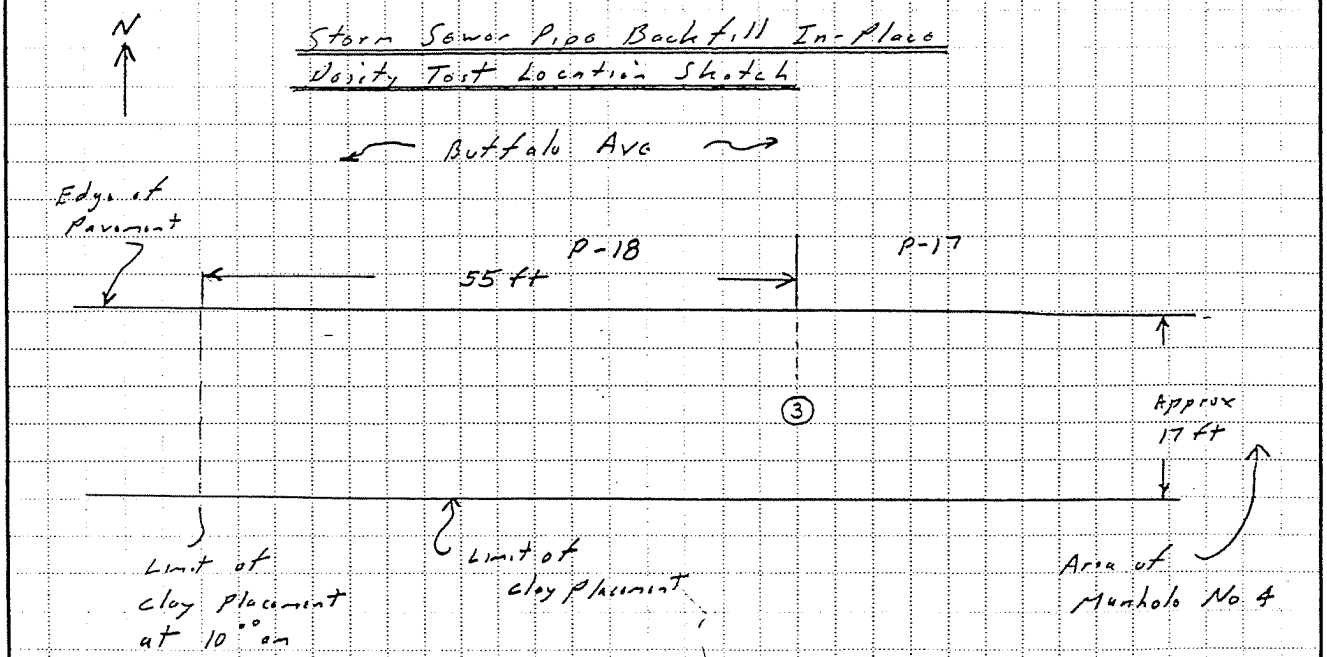
REMARKS:

Project 102nd Street Landfill — File No. 55099
Location Niagara Falls, NY — Date 8/5/96 — By GJK
Subject — Checked — By
Based on — Revised — By

Perimeter Soils In-place Density Test Location - Sketch



Storm Sewer Pipe Backfill In-Place Density Test Location Sketch



DAILY FIELD SUMMARY

DATE 8/6/96 FILE No. 55099

REPORT No. DFS-42 SHEET 1 of 7

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Occidental CONTRACTOR Smith Env Tech

WEATHER CONDITIONS Clear; temp 70 to 90°F; wind light

REMARKS

REPORT

7[30] Left for the site.

8[00] Arrive at site.

Standardize Troxler moisture/density gauge (SN 20803)

Moisture Standard Count 646 (-0.1 % var) } OK
Density Standard Count 2660 (-0.2 % var) }

Made in-place moisture/density tests on perimeter soils, storm sewer backfill and bulk head soils. See summary of results and location sketch attached.

12[00] Lunch (30 min)

Collected one sample of Frontier Stone Material (Bulk Head Area) for laboratory testing. Sample No 08066-1

5[30] Left the site

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

GZA

Gary Klawinski
PREPARED BY

Report No. DFS-42

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/16/96
File No. 550899
Technician GJK

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Perimeter soils; North side of site; See location sketch	1st lift today	107.1	17.8	C	91.0	8	Lift is about 1ft below top Buff Ave
2	"	1st lift today	108.6	13.9	C	92.3	8	Lift is about 3.5ft below Buff Ave.
3	"	2nd lift today	106.0	15.8	C	90.1	8	Lift is level with Buff Ave
4	Storm Sewer Line Backfill. Mix of Grand Island Clay and Nat Soils	1st lift today	102.4	17.4	C	87.0	8	Lift is about 6ft below Buff Ave. Test failed
5	Rest of No 4	"	107.4	14.3	C	91.2	8	
6	Storm Sewer Line Backfill. Mix of Grand Island Clay and Nat Soil	2nd lift today	85.0	26.2	C	72.9	8	Test failed
7	Perimeter soils; North side of site; See location plan	3rd lift today	107.2	14.3	C	91.1	8	Lift is about 2ft below top Buff Ave
8	"	4th lift today	106.0	15.0	C	90.1	8	Lift is about 3inches below top Buff Ave
9	South side of site Bulk Head fill. See location plan.	1st lift today	113.9	15.5	D	96.8	8	3rd lift total Torvane = 0.4 x 2.5 = 1 kg/cm^2
10	Retest of No 6	2nd —	105.9	15.3	C	90.0	8	
11	Storm sewer line backfill. Mix of Grand Island clay + Nat Material	3rd lift today	107.2	16.4	C	91.1	8	

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
D	114.5	15.0	Frontier Stone
C	117.7	13.6	Grand Island Material (Clay)

REMARKS:

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/6/96
File No. 5507
Technician G

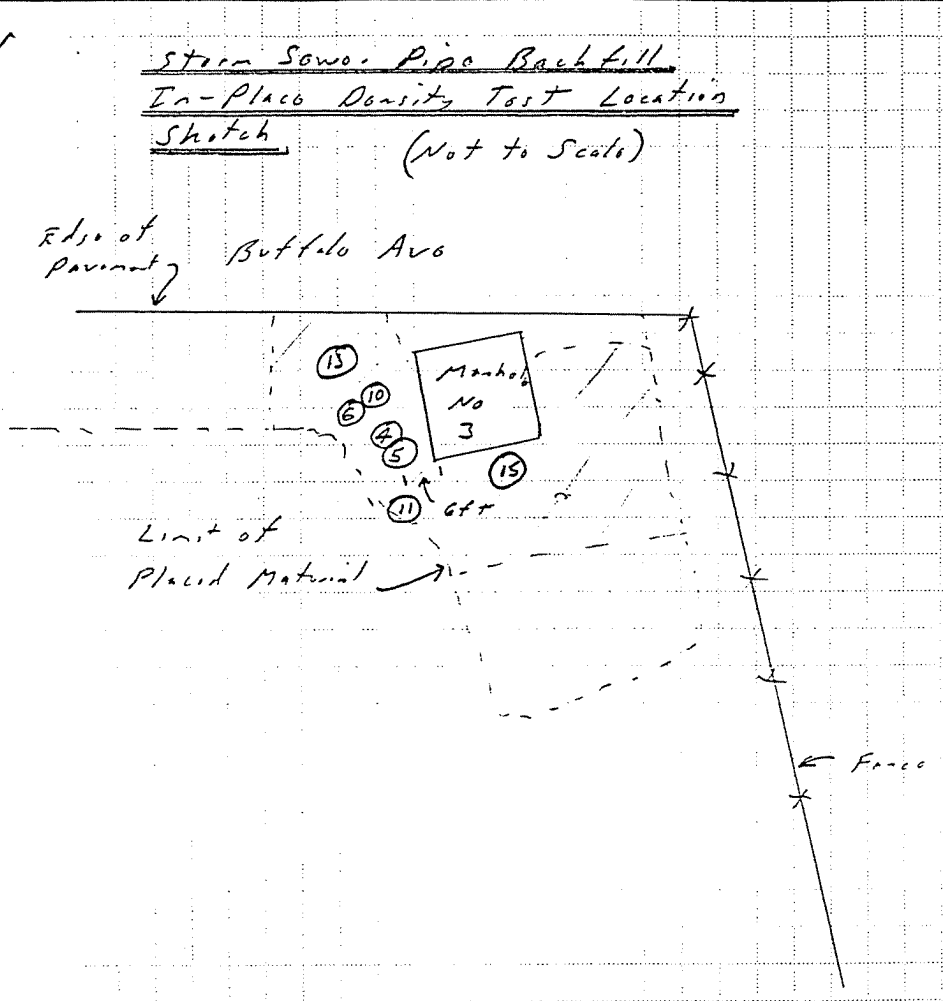
TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
12	Storm Sewer Line Backfill. Mix of Grand Island Clay & Natural Soil	1st lift	104.6	18.2	C	88.6	8	Lift is about 4 feet below Butt Ave Between existing MH 3 and New MH-6
13	"	4th lift today	108.5	15.9	C	92.2	8	Lift is about 2 to 3 feet below Butt Ave.
14	Retest of 12	1st lift	106.7	18.1	C	90.7	12	
15	Storm Sewer Line Backfill: Mix of Grand Island Clay & Natural Soil	5th lift	106.0	17.6	C	90.1	8	
16	Perimeter Soils on north side of site. See location sketch	5th lift	108.1	14.3	C	91.8	8	Lift is at grade with Butt Ave
17	Bulk head fill soil. South west part of site	3rd lift today	110.9	15.8	D	96.9	8	5th lift total Torvane = 0.4 x 2.5 = 1 KS/cm²
18	"	2nd lift today	111.4	16.8	D	97.3	8	4th lift total Torvane = 0.4 x 2.5 = 1 KS/cm²

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
C	117.7	13.6	Grand Island Material (Clay)
D	114.5	15.0	Frontier Stone Soil

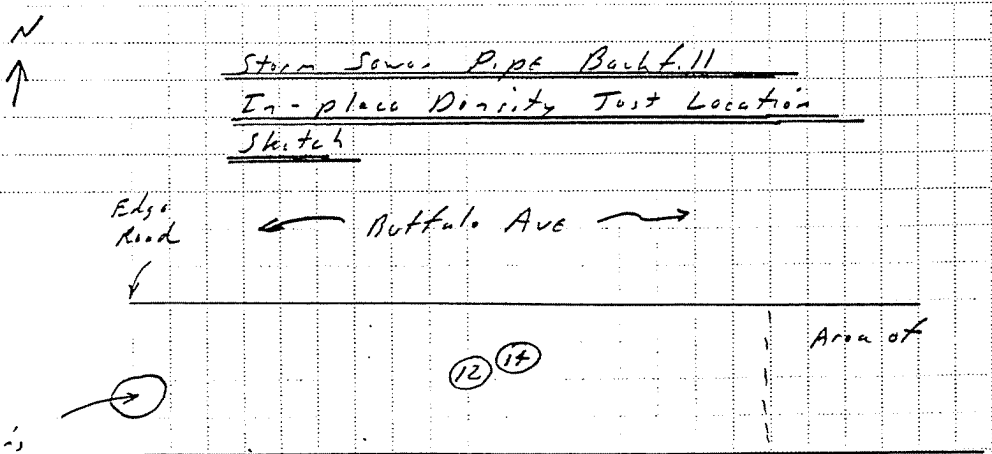
REMARKS:

Project	102nd Street Landfill			File No.	55099
Location		Date	8/6/96	By	GJR
Subject		Checked		By	
Based on		Revised		By	

Storm Sewer Pipe Backfill
In-Place Density Test Location
Sketch
(Not to Scale)



Storm Sewer Pipe Backfill
In-place Density Test Location
Sketch



DAILY FIELD SUMMARY

DATE 8/7/96 FILE No. 55099

REPORT No. DFS - 43 SHEET 1 of 8

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Oxy / Olin CONTRACTOR Smith Env Tech

WEATHER CONDITIONS clear; temp 70 to 90°F; wind light

REMARKS

REPORT

7^00 Arrive at office. Drop off concrete cylinders (Set 3 and 4) and bag sample 08066-1. Submit samples for testing. Pick up lab data transmittal for Smith.

7^45 Left the office. Travel to site.

8^20 Arrive at site.

Standardize Troxler moisture / density gauge (SN 20803)

Moisture standard count 649 (0.1 % var.)
Density standard count 2687 (0.9 % var.) } OK

Made in-place density and moisture test on bulkhead material and storm sewer line backfill. See attached test results sheet and location sketch.

12^00 Lunch (30 min)

1^20 Placed concrete at Manhole # 4. See attached concrete test report and ticket.

5^30 Left the site.

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See attached accounting summary

GZA

Gary Klawinski
PREPARED BY

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/7/96
File No. 55099
Technician GJK

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Bulkhead area. Retest of No 18 (8/6/96)	—	110.3	(16.1)	D	96.4	8	• 4th lift total • Torvane; 0.4, 0.45, 0.4, 0.4, 0.45 Avg Torvane; 0.42 x 2.5 = 1.05 Kg/cm²
2	Storm Sewer Backfill. Manhole No.1	1st lift today	86.5	19.0	C	(73.5)	8	
3	Storm Sewer Backfill Manhole No.3	1st lift today	104.9	14.1	C	(89.1)	8	• Lift is about level with top of MH 3.
4	Storm Sewer Backfill; Between existing MH3 and New MH-6	1st lift today	101.2	19.7	C	(86.0)	8	• Material is a mix of Grand Island material and natural soils. • Lift is about 6 inches below Bulk Ave
5	Retest of No. 2 (recompacted)	—	99.2	16.1	C	(84.3)	8	• Material is a mix of Grand Island material and natural soils.
6	Retest of No. 2 (recompacted)	—	101.	16.9	C	(86.0)	8	"
7	Retest of No. 2 (recompacted)	—	104.9	18.7	C	(89.2)	8	The contractor placed the next lift with Oxy approval.
8	Storm Sewer Backfill Manhole 1	2nd lift today	109.1	17.9	C	92.7	8	• Material is mix of Grand Island material and natural soil.
9	"	3rd lift today	101.9	19.5	C	(86.6)	8	"
10	Retest of No. 9 (recompacted)	—	105.9	19.9	C	90.0	8	"
11	Retest of No. 3 (recompacted)	—	111.4	14.1	C	94.1	8	

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
D	114.5	16.0	Frontier Stone Material
C	117.7	13.6	Grand Island Material

REMARKS:

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/7/96
File No. 55099
Technician GJK

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
12	Bulk Head Fill See location sketch	1st lift today this area	112.6	16.2	D	98.4	8	• Total 2nd lift. Torvane readings: 0.46, 0.40, 0.56, 0.49, 0.40 Avg Torvane = 0.46 × 2.5 = 1.2 Ksf/cm²
13	Storm Sewer Backfill See location plan	1st lift today	100.0	18.6	C	84.9	8	• Material is Grand Island clay mix with natural soils. • Lift is about 3 ft below Bulk Hd Ave
14	Retest of No 13 (recompacted)	–	102.4	19.6	C	87.0	8	
15	Retest of No 4	–	106.0	15.7	C	90.1	8	
16	Retest of No 13 (recompacted)	–	105.0	17.3	C	89.2	8	
17	Retest of No 13 (recompacted)	–	103.6	18.5	C	88.0	8	
18	Retest of No 13 (Smooth Drum Recompacted)	–	109.0	17.2	C	92.6	8	
19	Storm Sewer Backfill See location plan	2nd lift today	102.4	18.2	C	87.0	8	• Material is mix of Grand Island material and natural soil. • Lift is about 2.5 ft below Bulk Hd Ave
20	Retest of No 19	3rd lift today	106.3	19.3	C	90.3	8	
21	Bulk head Fill Retest of No 12	–	111.5	14.1	D	97.4	8	Torvane readings: 0.52, 0.40, 0.66, 0.51, 0.42 Avg Torvane = 0.50 × 2.5 = 1.4 Ksf/cm²
22								

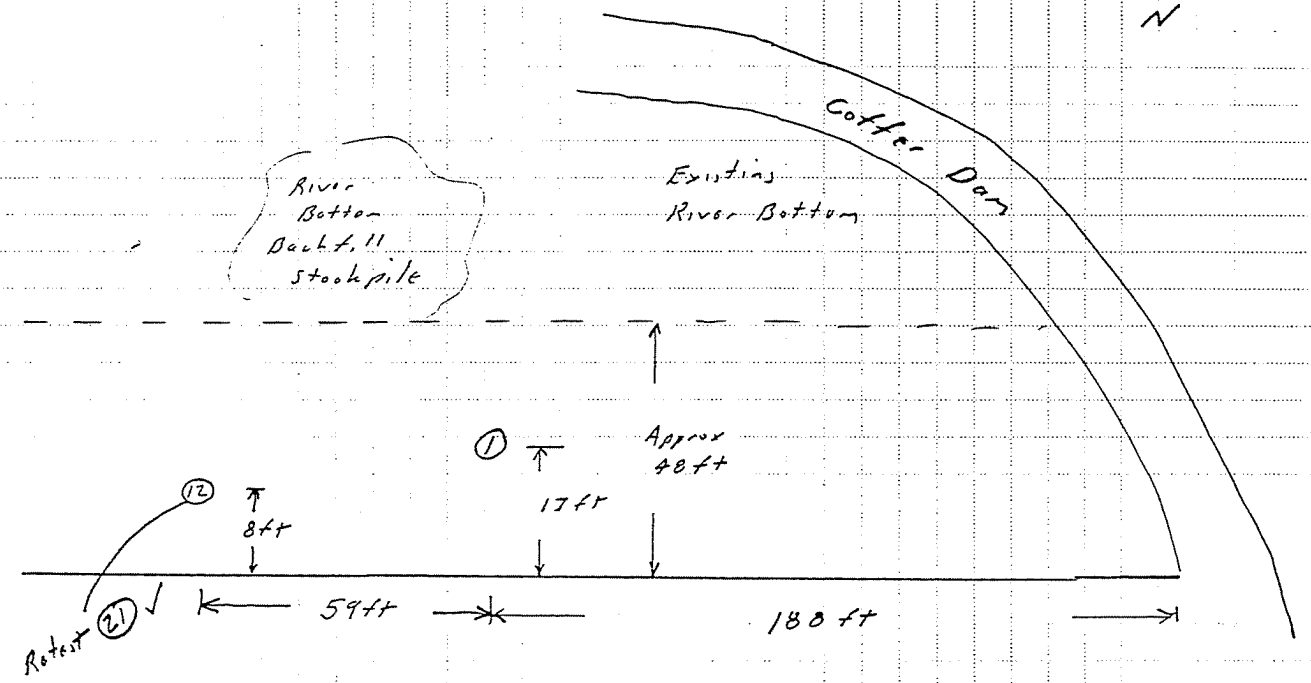
PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE

REMARKS:

Project 102nd Street Landfill — File No. 55099
Location — Date 8/7/96 — By GJK
Subject — Checked — By
Based on — Revised — By

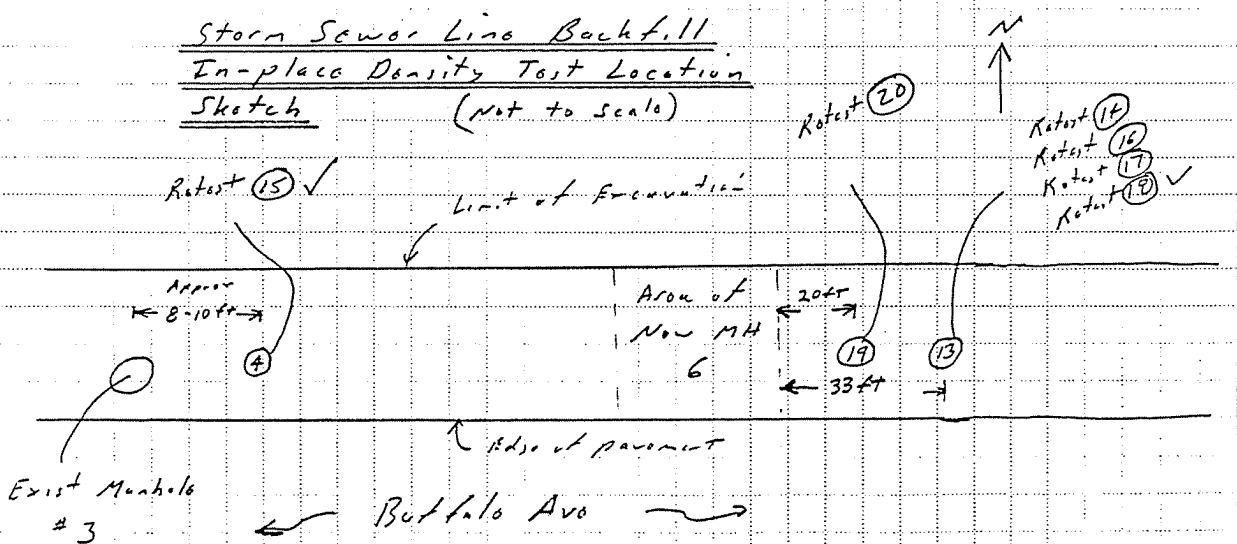
Bulk Head Material In-place Density Test Location Sketch

(Not to Scale)



Storm Sewer Line Backfill In-place Density Test Location Sketch

(Not to Scale)



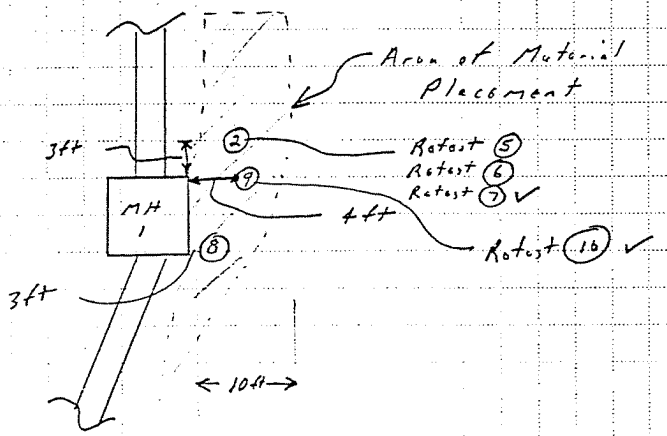
Project 102nd Street Landfill — File No. 55099
Location — Date 8/7/96 — By GJK
Subject — Checked — By
Based on — Revised — By

Storm Sewer Line Backfilling In-place Density Test Location Sketch

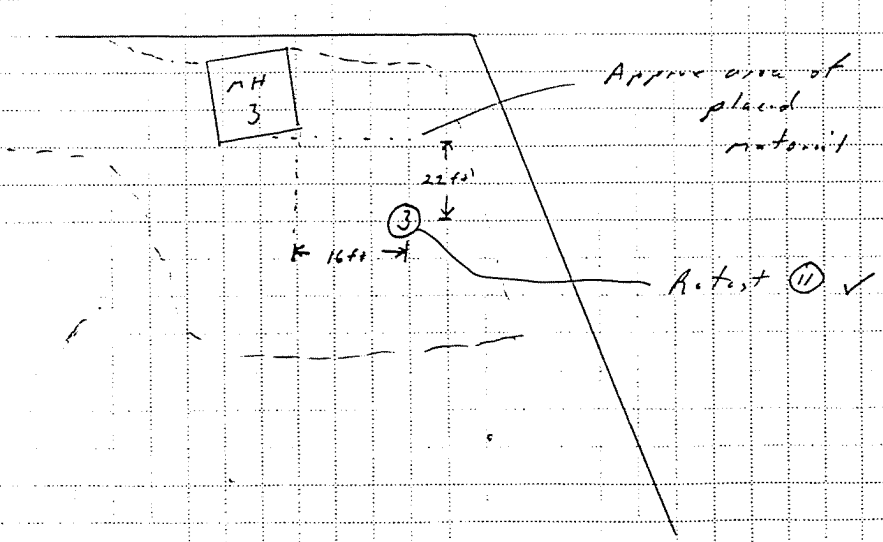
(not to scale)

N

Manhole 1



Manhole 3



DAILY FIELD SUMMARY

DATE 8/8/96 FILE No. 55099

REPORT No. DFS-44 SHEET 1 of 4

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Oxy / OLin CONTRACTOR Smith Environmental

WEATHER CONDITIONS rain → overcast ; temp 70 to 80 °F ; wind light

REMARKS

REPORT

8[30] Arrive at the site. Heavy rain

Make plans to do a gradation test on Rip Rap out From the Stone.

Standards Troxler moisture / density gauge (SN 20803)

Moisture Standard Count	652	(0.7 % var.)	} OK
Density Standard Count	2672	(0.2 % var.)	

Make in-place moisture / density test on storm sewer line backfill and bulkhead material. See attached results and location sketch.

12[00] Lunch (30 min) Heavy

4[00] Left the site

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See accounting summary

GZA

Gary Klawitz
PREPARED BY

Report No. DFS-44

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/8/96
File No. 55099
Technician CJK

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm sewer line backfill. See location plan	1st lift today	110.5	16.1	C	93.9	8	• Material is mix of Grand Island and natural soils. • Lift is about 3.5ft below Buff Ave
2	Bulk head area. See location plan	1st lift today	111.8	14.4	D	97.6	8	• Torvane Readings: 0.42, 0.45 (Heavy Rain) • Avg Torvane 0.43 x 2.5 = 1.1 KS/cm²
3	Storm Sewer line backfill See location plan	2nd lift today	109.8	15.2	C	95.9	8	• Frontier stone material
4	Storm Sewer Backfill. 4ft east of South east corner of manhole 4	1st lift today	105.9	20.3	C	90.0	12	• Material is mix of Grand Island and natural material • Lift is about 1.5 ft below top of MH 4
5	Storm Sewer Backfill, 8ft east of southeast corner of manhole 4	2nd lift today	108.6	14.3	D	92.3	12	• Frontier stone material • Lift is about 0.5 ft below top of MH 4
6	Storm Sewer Backfill. 8ft east of north east corner of MH 4	3rd lift today	113.5	13.2	D	96.4	12	• Frontier stone material • Lift is about level with top MH 4

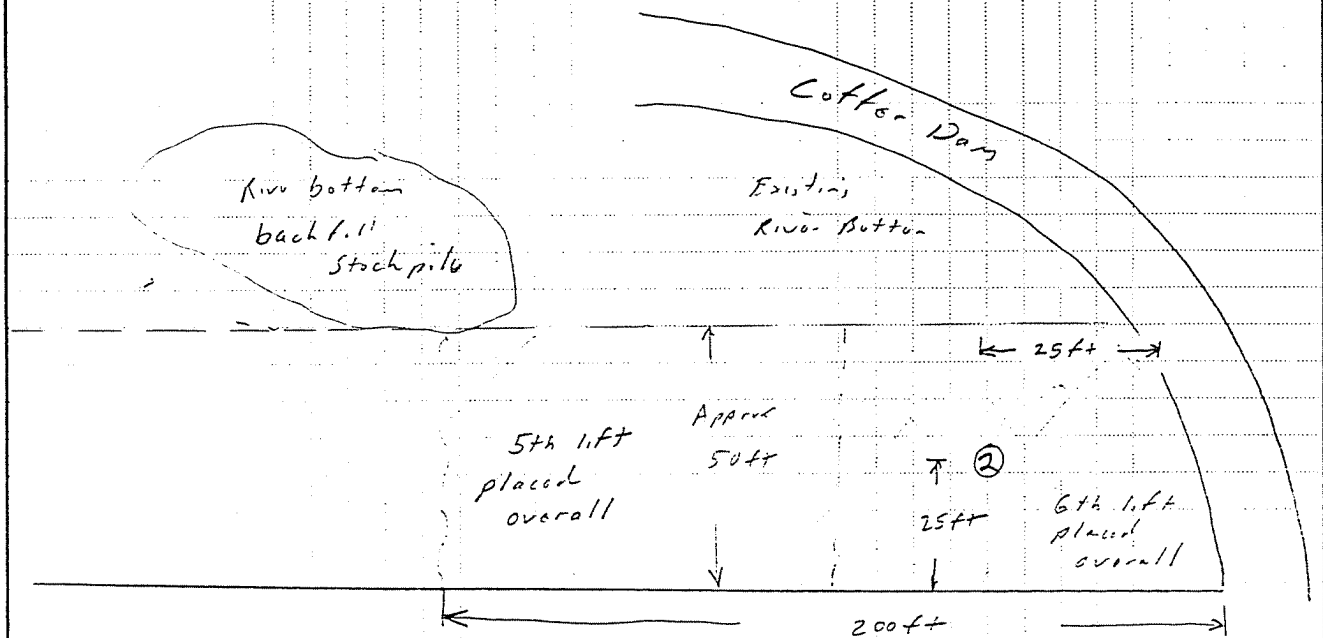
PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
D	114.5	16.0	Frontier Stone Material
C	117.7	13.6	Grand Island Material

REMARKS:

Project 102nd Street Landfill — File No. 55099
Location — Date 8/8/96 — By GJH
Subject — Checked — By
Based on — Revised — By

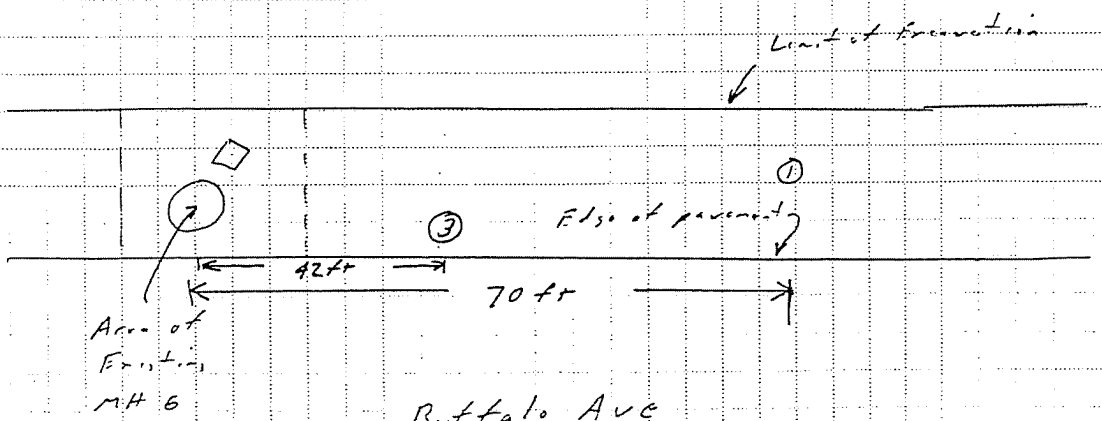
Bulk Head material In-place Density Test Location Sketch

(Not to scale)



Storm Sewer Line Backfill In-place Density Test Location Sketch

(Not to scale)



DAILY FIELD SUMMARY

DATE 8/9/96 FILE No. 55099

REPORT No. DFS-45 SHEET 1 of 4

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Oxy / Olin CONTRACTOR Smith Environmental Tech

WEATHER CONDITIONS clear; temp 60 to 80°F; wind moderate; Heavy rain last night.

REMARKS

REPORT

8[15] Left for the site

8[45] Arrive at the site.

Standardize Troxler moisture / density gauge (SN 20803)

Moisture Standard Count 652 (0.0 % var) } OK
Density Standard Count 2674 (+0.1 % var) }

Collected bag sample of Frontier Stone Material for soils laboratory testing. 08096-1

Made in-place density tests on Bulk Head material and Storm Sewer Line backfill material. See attached test results and location sketch.

12[00] Lunch

4[30] Left the site.

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See attached accounting summary

GZA

Gary Klawinski
PREPARED BY

NS Front cleet

Report No. DFS-45

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/9/96
File No. 55099
Technician GJR

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm sewer line backfill. See location plan	1st lift today	109.8	14.6	D	95.9	12	• Lift is about 3.5 ft below Buff Ave
2	"	1st lift today	106.2	14.7	D	92.6	12	• Lift is about 1.0 ft below Buff Ave
3	"	2nd lift today	120.2	11.6	D	105.0	12	• Lift is about 0.5 ft below Buff Ave
4	Bulk Haul Area See Location Plan	1st lift today	118.1	14.3	D	103.2	12	• Torvane readings; 0.38, 0.42, 0.40, 0.35, 0.38 • Torvane Avg = 0.39 × 2.5 = (0.97 kg/cm²)
5	"	1st lift today	117.0	14.3	D	102.2	12	• Torvane readings: 0.40, 0.51, 0.38, 0.42, 0.37 • Torvane Avg = 0.42 × 2.5 = (1.04 kg/cm²)
	This test represents a mix of Frontier Stone Material hauled to the site on 8/9/96 (observed to be more silty) and previously placed material.							
6	Storm sewer line backfill See location plan	2nd lift today	112.5	13.5	D	98.2	12	• Lift is about 0.5 ft below Buff Ave

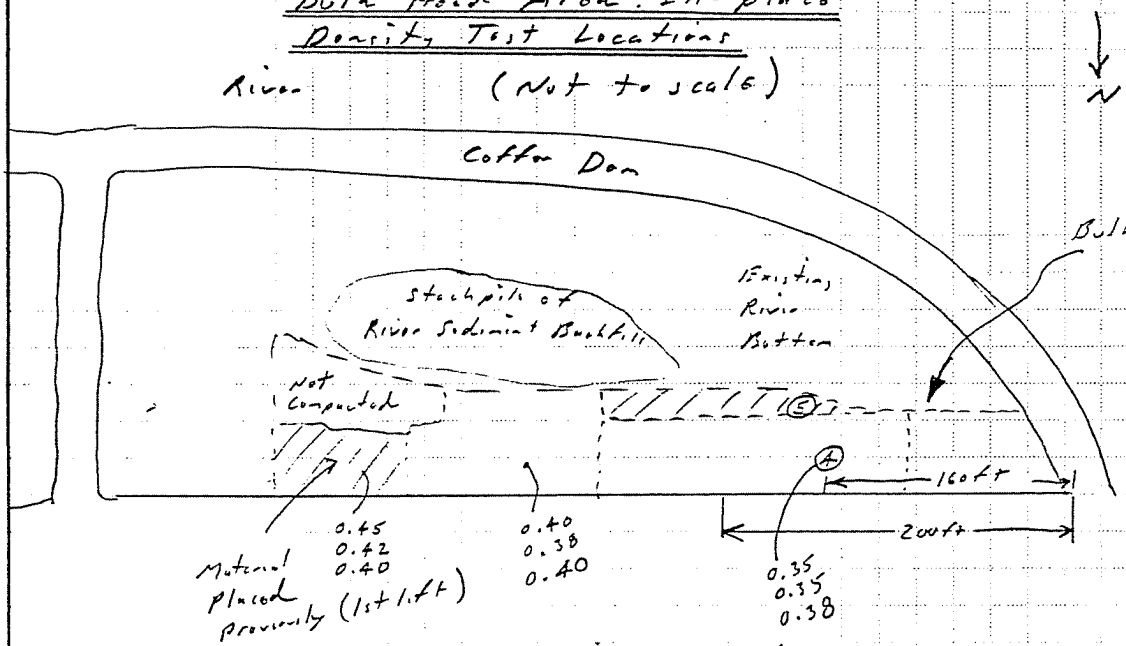
PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
D	114.5	16.0	Frontier Stone Material 14 - 18 %

REMARKS:

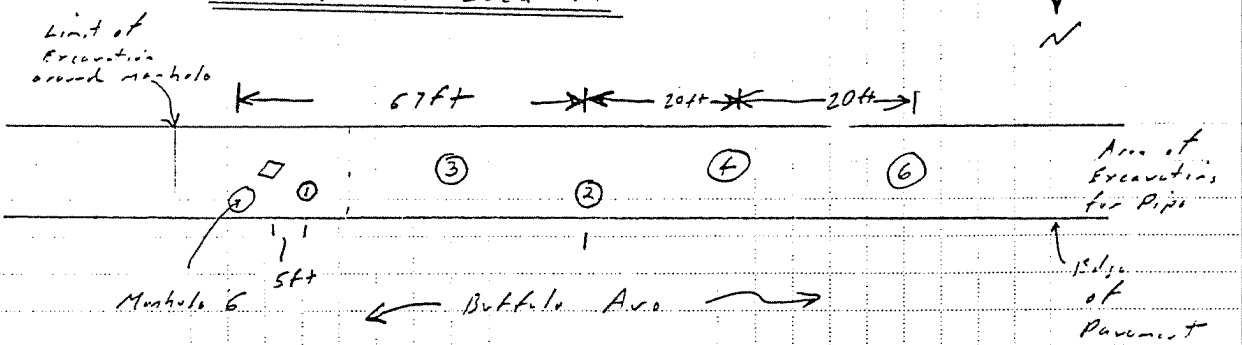
Project 102nd Street Landfill File No. 55099
Location Date 3/9/96 By GSM
Subject Checked By
Based on Revised By

Bulk Head Area. In-place Density Test Locations

(Not to scale)



Storm Sewer Line Backfill. In-place Density Test Location



DAILY FIELD SUMMARY

DATE 8/12/96 FILE No. 55099

REPORT No. DFS-46 SHEET 1 of 5

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER _____ CONTRACTOR Smith Environmental Tech

WEATHER CONDITIONS clear; temp 65 to 75°F; wind light

REMARKS _____

REPORT

7^45 Arrive at office. Drop off soil and concrete sample for testing.
8^15 Left the office.
8^45 Arrive at the site.

Standardize Troxler moisture/density gauge SN 20803

Moisture Standard Count	651	(0.4 % var)
Density Standard Count	2649	(-0.7 % var)

Made in-place moisture/density tests on backfill for storm drain, on fill material on north side of landfill and bulk head material. See attached results and location sketch.

12^00 Lunch (30 min)

Smith went with GZA (Don Wolf) to test the gradation of Rip-Rap material at Frontier Stone.

Bulk head material from Frontier Stone was not hauled to the site in the afternoon.

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time _____
Travel Time _____
Office Time _____
Total Time _____

} See attached accounting summary

GZA

Gary Klawinski
PREPARED BY

REPORT No. DFS-46

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, N.Y.
Contractor Smith

Date 8/12/96
File No. 55099
Technician EJH

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Bulk head material See location plan	Existing Lift	119.8	14.3	D	104.6	12	• Torvane readings: 0.35, 0.39, 0.42, 0.31, 0.40 • Avg Torvane = 0.37 × 2.5 = (0.94 Kg/cm²)
2	"	1st lift today	109.2	14.6	D	95.3	12	• Torvane readings: 0.35, 0.40, 0.32, 0.38, 0.36. • Avg Torvane = 0.36 × 2.5 = (0.90 Kg/cm²)
3	Storm sewer backfill. 10 ft west of manhole 6.	1st lift today	103.5	16.6	C	(88.0)	12	• Lift is about 2.5 ft below Butt Ave.
4	Storm sewer backfill. 5 ft east of manhole 7.	1st lift today	111.6	11.4	C	94.8	12	• Lift is about 4.5 ft below Butt Ave
5	Retest of No. 3	—	107.2	15.3	C	91.1	12	✓
6	Storm sewer backfill. 8 ft north of manhole No 2.	1st lift today	111.1	14.3	C	94.4	12	• Lift is about 3 ft below Butt Ave
7	Storm sewer backfill. 15 west of manhole No. 7	2nd lift today	110.9	13.8	C	94.2	12	• Lift is about 4 ft below Butt Ave
8	North side of landfill near D coll. East side	1st lift today	115.5	8.4	Fill E	92.4	10	• Fill material regraded from top of landfill.
9	Same test location as No. 8 Retest at BS depth		102.0	9.7	Fill E	—	BS	
10	North side of landfill near D coll West side	1st lift today	109.0	11.9	Fill E	87.2	8	
11	Same general area as test No 10 but not compacted	"	99.7	13.7	Fill E		8	• Test requested by Oxy / Flour

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
D	114.5	16.0	Frontier Stone Material
C	117.7	13.6	Grand Island
E	125.0	11.5	Fill Material

REMARKS:

REPORT No. DFS-46

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, New York
Contractor Smith Environmental

Date 8/12/96
File No. 55099
Technician GSM

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
12	Storm sewer backfill. 75 ft west of manhole 7.	3rd lift today	106.1	16.3	C	90.1	12	• Lift is about 3.5 ft below Surface Ave
13	Storm sewer backfill. 50 ft west of manhole 7.	4th lift today	106.0	15.8	C	90.0	12	• Lift is about 3 ft below Surface Ave
14	Storm sewer backfill. 20 ft west of Manhole 7.	5th lift today	107.6	16.5	C	91.4	12	• Lift is about 2.5 ft below Surface Ave
15	Bulk head area *See location plan	1st lift today	114.8	14.3	D	100.2	12	•Torvane readings; 0.36, 0.50, 0.42, 0.39, 0.36 •Avg Torvane = 0.41 × 2.5 = 1.01 kg/cm²
16	Retest of No 1 and No 2	—	109.9	14.4	D	96.0	12	• Torvane readings; 042, 0.40, 0.45, 0.52, 0.38 •Avg Torvane = 0.44 × 2.5 = 1.1 kg/cm²

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE

REMARKS:

DAILY FIELD SUMMARY

DATE 8/13/96 FILE No. 55099

REPORT No. DFS-47 SHEET 1 of 7

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Oxy / Olin CONTRACTOR Smith Env Tech

WEATHER CONDITIONS clear; temp 70 to 85°F; wind moderate

REMARKS

REPORT

8³⁰ Arrive at the site.

Met with P. Porter.

Standardize Troxler moisture/density gauge SN 20803

Moisture standard 651 (0.2 %var.)
Density standard 2659 (-0.3 %var.) 3 Vs

Made in-place moisture/density tests on storm sewer line back fill.

12⁰⁰ Lunch.

Concrete placed at MH 1, MH 4, MH 5, MH 6 & MH 7. See attached Tickets and Placement Report.

4³⁰ Left the site.

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See accounting summary

GZA

Gary Hamashi
PREPARED BY

REPORT No. DFS-47

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor South

Date 8/13/96
File No. 55099
Technician GJH

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm sewer backfill. 10 ft west of southwest corner of manhole 2	1st lift today	112.1	13.4	C	95.3	8	• Lift is about 2 ft below MH 2 top
2	Storm sewer backfill. 140 ft west of MH 7	1st lift today	96.0	19.8	C	81.6	12	• Lift is about 0.5 ft below bucket AVG SEE REPORT DFS-48 FOR RETEST
3	Storm sewer backfill. 10 ft southeast of manhole 3.	1st lift today	116.4	14.1	C	98.9	8	• Lift is level with top of MH 3
4	Storm sewer backfill. 6 ft east of Manhole 4.	1st lift today	103.8	16.8	C	88.2	8	• Lift is about 3 ft below top of MH 4
5	Retest of No 4	—	106.5	17.6	C	90.5	8	〃

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
C	117.7	13.6	Grand Island
O	114.5	16	Frontier Stone

REMARKS:

DAILY FIELD SUMMARY

DATE 8/14/96 FILE No. 35099

REPORT No. DFS-48 SHEET 1 of 3

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Oxy/Olin CONTRACTOR Smith Enviro Tech

WEATHER CONDITIONS clear; temp 70 to 85°F; wind light

REMARKS

REPORT

9^00 Left the office. Travel to the site.

9^30 Arrive at site

Met with P. Porter

Standardize Troxler moisture/density gauge SN20803

Moisture count 654 (0 % var.)
Density count 2667 (0 % var.) } OK

Made in-place moisture/density test on storm sewer backfill. See attached test results.

12^00 Lunch

2^30 Left the site

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See daily accounting summary

GZA

Gary Klawinski
PREPARED BY

6

2667

Report No. DFS-48

Page 2 of 3

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/14/96
File No. 55099
Technician GJN

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm sewer backfill. 20 ft west of manhole 4.	1st lift today	113.9	11.6	C	96.8	8	• Lift is about 2.5 ft below top of MH-4
2	Storm sewer backfill. 75 ft south of manhole 3.	1st lift today	111.7	15.3	C	94.9	8	• Lift is level with manhole 3.
3	Retest of No 2 8/13/96	—	107.3	15.6	C	91.2	8	✓
4	Storm sewer backfill. 100 ft east of manhole 4	1st lift today	115.5	15.4	C	98.1	8	• Lift is 1 ft below top of Bluff Ave

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
C	117.7	13.6	Grand Island

REMARKS:

DAILY FIELD SUMMARY

DATE 8/15/96 FILE No. 55099

REPORT No. DFS-49 SHEET 1 of 5

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Oxy / Olin CONTRACTOR Smith Environmental Tech

WEATHER CONDITIONS clear; temp 70 to 85°F; wind moderate

REMARKS

REPORT

8³⁰ Arrive at site

Met with P. Porter.

Standardize Troxler moisture/density gauge SN 20803

Moisture Standard Count	648	(-0.6% var.) ✓
Density Standard Count	2674	(0.5% var.) ✓

Made in place moisture/density tests on storm sewer backfill, bulk head material and at Level C PPE on landfill clean fill.

12⁰⁰ Lunch (30 min)

3³⁰ Left the site

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See daily accounting summary

GZA

Gary Klawinski
PREPARED BY

Report No. DFS-49

Page 2 of 5

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 6/15/96
File No. 55099
Technician G. Klawinski

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
	See Location sketch							
1	Regrade of existing landfill material, South of D cell. North slope	At Surface	119.7	10.3	E	95.7	12	Level C
2	"	1ft below Surface	118.7	13.3	E	94.9	12	Level C
3	"	2.5 ft below Surface	111.4	13.2	E	89.1	12	Level C; Proctor value must be 123.8 or less for this test to be 90% of γ_d max.
4	Storm sewer backfill; 17ft west of manhole 3, 10ft south of road edge	1st lift today	112.4	13.1	C	95.5	12	Lift is 1 ft below top of Buffalo Ave.
5	Bulkhead material; See location sketch	2nd lift overall	109.3	16.0	D	95.4	12	• Torvane readings: 0.46, 0.51, 0.65, 0.38 (0.48) • Avg Torvane = 0.50 x 2.5 = (1.2 kg/cm²)
6	Storm sewer backfill; 10ft west of manhole 4, 5ft south of road edge	1st lift today	112.0	14.0	D	97.8	12	Lift is 1ft below top of Buff Ave
7	Regrade of existing landfill material, South of D cell. North slope	1st lift today	119.3	12.7	E	95.4	12	
8	Storm sewer backfill: 50ft west of MH-5; 12ft south of edge of road	1st lift today	111.2	13.9	D	97.5	12	Lift is 3.5ft below Buff Ave
9	Storm sewer backfill; 45ft east of MH-7; 6ft south of edge of road	1st lift today	106.8	13.7	D	90.1	8	Material is a mix of Frontier stone, and natural soils. Lift is 3 ft Below Buff Ave
10	Storm sewer backfill, 35ft west of MH-5; 5ft south of edge of road	2nd lift today	118.7	11.5	D	100.8	8	Lift is 3 ft below Buff Ave.

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
C	117.7	13.6	Grand Island
D	114.5	16.0	Frontier Stone
E	125.0	11.5	Landfill Material

REMARKS:

DAILY FIELD SUMMARY

DATE 8/16/96 FILE No. 55099

REPORT No. OFS-50 SHEET 1 of 4

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Oxy/Olin CONTRACTOR Smith Environmental Tech

WEATHER CONDITIONS overcast; temp 65 to 75°F; wind light

REMARKS

REPORT

9⁰⁰ Left the office

9³⁰ Arrive at site.

Standardize Troxler moisture/density gauge SN 20803

Moisture Standard Count 653 (0.3% Var)
Density Standard Count 2662 (0.0% Var)

Made in-place density moisture tests on storm sewer backfill and bulk hand material. See attached results and location sketch.

12⁰⁰ Lunch. (1 hr)

4¹⁵ Left the site

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time ____
Travel Time ____
Office Time ____
Total Time ____

} See daily accounting summary

GZA

Gary Klawinski
PREPARED BY

Report No. DFS-50

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith Environmental Tech

Date 8/16/96
File No. 55099
Technician G. Klowinski

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm sewer backfill. 25 ft east of MH 7. 4 ft south of roadedge	1st 1 ft today	111.1	14.8	D	97.0	8	Lift is 1.5 ft below top of Built Ave
2	Storm sewer backfill. 6 ft west of MH 3 (existing) 6 ft south of roadedge	1st 1 ft today	119.8	12.8	D	104.6	8	Lift is 2 ft below top of Built Ave
3	Storm sewer backfill. 10 ft west of MH 6. 4 ft south of roadedge	1st 1 ft today	110.1	12.9	D	103.1	8	Lift is 1.5 ft below top of Built Ave
4	Storm sewer backfill. 25 ft west of MH 5. 8 ft south of roadedge	1st 1 ft today	115.6	12.6	D	101.0	8	Lift is 1 ft below top of Built Ave
5	Bulkhead material See attached location sketch	2nd 1 ft overall	110.1	14.7	D	96.2	12	• Torvane readings: 0.37, 0.52, 0.44, 0.39, 0.50 • Avg Torvane = 0.44 × 2.5 = 1.1 kg/cm²
6	〃	3rd 1 ft overall	115.9	14.2	D	101.2	12	• Torvane readings: 0.61, 0.44, 0.47 0.41, 0.38 • Avg Torvane = 0.46 × 2.5 = 1.1 kg/cm²
7	Storm sewer backfill. 25 ft east of MH-5. 6 ft south of roadedge	1st 1 ft today	112.2	14.5	D	98.0	12	Lift is 1 ft below top of Built Ave
8	Regraded landfill material. North slope of landfill north of coll.	1st 1 ft today	112.6	12.1	E	90.0	12	
9	Storm sewer backfill. 4 ft east of manhole 1. 1.5 ft below top manhole	1st 1 ft today	117.8	12.3	D	102.8	8	
10	Bulkhead material See location plan. 3rd/4th 1 ft overall	2nd 1 ft today	125.2	14.8	D	109.2	12	• Torvane readings: 0.44, 0.38, 0.61, 0.46, 0.54 • Avg Torvane: 0.49 × 2.5 = 1.2 kg/cm²
11	40 ft east of manhole 9. 4 ft south of roadedge 〃	1st 1 ft today	105.9	15.7	D	92.5	8	List is 2.5 feet below Built Ave

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
C	117.7	13.6	Grand Island
D	114.5	16.0	Frontier Stone
E	125.0	11.5	Landfill Material

REMARKS:

DAILY FIELD SUMMARY

DATE 8/19/96 FILE No. 55099

REPORT No. DFS-51 SHEET 1 of 7

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY.

OWNER Occ. Oxy. Lois CONTRACTOR Smith Environmental Inc

WEATHER CONDITIONS clear ; temp 70 to 85°F ; wind light

REMARKS

REPORT

9[30] Left for the site.

10[00] Arrive at site.

Met with P. Porter.

I walked the landfill grading area (inside exclusion zone). to observe compaction and grading operation as requested by Smith.

Standardize Troxler moisture/density gauge SN 20803.

Moisture Standard Count	644	(-1.2 % Var)	}
Density Standard Count	2669	(0.1 % Var)	} Sv. ok

12[15] Lunch

Collected bag sample of Frontier Stone material from Bulk head area of cell 2. Sample No 08196-1

4[15] Left the site

4[45] Return to office to drop off samples

Reviewed by:
John J. Danzer, P.E.

Field Time ____
Travel Time ____
Office Time ____
Total Time ____
} See daily accounting summary

GZA

Gary Klawinski
PREPARED BY

REPORT No. DFS-51

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/19/96
File No. 55099
Technician G. Klemish

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm sewer backfill 2.5 foot below top of Buff Ave. 70 ft west of MH-9, 1 ft south of road edge	1st lift today	100.7	16.5	C	86.0	12	Material is mix of Grand Island and natural soils.
2	Retest of No 1	—	114.3	13.7	C	97.1	12	
3	Storm sewer backfill. 1 ft south of MH-9. 3 ft below top of Buff Ave	1st lift today	108.7	16.2	C	92.3	12	Material is mix of Grand Island and natural soils
4	Storm sewer backfill. 1 ft south of MH-7. 1 ft below top of Buff Ave	1st lift today	107.5	10.6	C	91.4	12	• Material was compacted on 8/16/96
5	Storm sewer backfill. 1 ft south west of MH-6, 1 ft below top of Buff Ave	"	120.8	11.1	C	102.6	"	"
6	Bulkhead area. Coll 2 See location plan	1st lift today	120.3	15.3	D	105.1	12	2nd lift overall. Torvane Readings: 0.56, 0.41, 0.38, 0.40 0.42 Avg Torvane = 0.43 × 2.5 = 1.1 KS/cm²
7	Storm sewer backfill. 40 ft west of MH-9. 2.5 ft below Buff Ave	2nd lift today	111.5	13.0	C	94.7	12	-5 ft south of edge of Buff Ave
8								
9								
10								

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
C	117.7	13.6	Grand Island
D	114.5	16.0	Frontier Stone

REMARKS:

DAILY FIELD SUMMARY

DATE 8/20/96 FILE No. 55099

REPORT No. DFS-52 SHEET 1 of 4

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Occidental CONTRACTOR Smith Environmental Tech

WEATHER CONDITIONS overcast; temp 70 to 85°F; wind moderate to high

REMARKS

REPORT

9⁰⁰ Left for the site.

9³⁰ Arrive at site.

Standardize Troxler moisture/density SN 20803

Moisture Standard Count 647 (-0.4 % var)
Density Standard Count 2658 (-0.4 % var) } V

Made in-place moisture and density tests on storm sewer backfill and bulk head area cell 2. See attached test results and location sheet

12⁰⁰ Lunch (30 min)

4³⁰ Left the site

5⁰⁰ Arrive at office. Drop off slurry wall test samples

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See daily accounting summary

GZA

Gary Klawiski
PREPARED BY

REPORT No. DFS-52

Page 2 of 4

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/20/96
File No. 55099
Technician G. Klawinski

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm sewer backfill. 7ft east of MH-5. 6ft south of road edge.	1st 1.ift tested today	106.7	10.4	C	90.6	12	• Lift is about 2.5 ft below Butt Ave
2	Bulkhead Area Coll 2 3rd lift over all.	1st 1.ift tested today	118.4	14.1	D	103.4	12	• Torvane readings: 0.4+, 0.40, 0.50, 0.42, 0.52 • Avg Torvane; 0.46 × 2.5 = 1.1 kg/cm²
3	Storm Sewer Backfill. 30ft west of MH 9. 3ft south of road edge	1st 1.ift tested today	113.6	13.8	C	96.5	12	• Lift is about 1ft below Butt Ave
4	Storm Sewer Backfill. 15ft east of MH 5. 1ft south of road edge	2nd 1.ift tested today	107.7	10.9	C	91.5	12	• Lift is about 1ft below Butt Ave
5	Storm Sewer Backfill. 1ft west of MH 1. Lift is level with top of MH 1	1st 1.ift	117.4	7.9	C	99.8	12	• Lift was placed and compacted on 8/19
6	Storm Sewer Backfill. 45ft west of MH 10. Lift is 3ft below top Butt Ave	1st 1.ift today	106.7	14.4	C	90.6	12	
7	Storm Sewer Backfill. 1ft west of MH 10. Lift is 3.5ft below Butt Ave	1st 1.ift today	110.5	10.3	C	93.9	12	
8	Storm Sewer Backfill. 36 ft east of MH 11. Lift is 2 ft below Butt Ave	1st 1.ift today	113.9	9.6	C	96.9	12	

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
C	117.7	13.6	Grand Island Material
D	114.5	16.0	Frontier Stone Material

REMARKS:

DAILY FIELD SUMMARY

DATE 8/21/96 FILE No. 55099

REPORT No. DFS-53 SHEET 1 of 5

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Oxy/Olin CONTRACTOR Smith Envir Tech

WEATHER CONDITIONS clear; temp 70 to 85°F; wind light

REMARKS

REPORT

9⁰⁰ Left the office

9³⁰ Arrive at site.

Met with P. Porter.

Standardize Troxler moisture/density gauge SN 20803

Moisture Standard Count 644 (-0.6 % Var.)
Density Standard Count 2656 (-0.4 % Var.) } OK

Corrosne placed concrete in invert of MH 9, 10 and 11. Time of placement according to Corrosne was 8³⁰ to 9⁰⁰. See attached ticket.
No concrete field tests were made by GZA for this placement.

12⁰⁰ Lunch

1⁰⁰ Collected two bags of Summit Material with Smith.

Made in-place moisture/density tests on ~~Storm Sewer Backfill~~ and Bulkhead material (Area 2) GJK

3¹⁵ Left thosite

3⁴⁵ Arrive at office. Drop off Summit Pit samples

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See daily accounting summary

GZA

Gary Klawinski
PREPARED BY

DFS-53

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/21/96
File No. 35099
Technician CJR

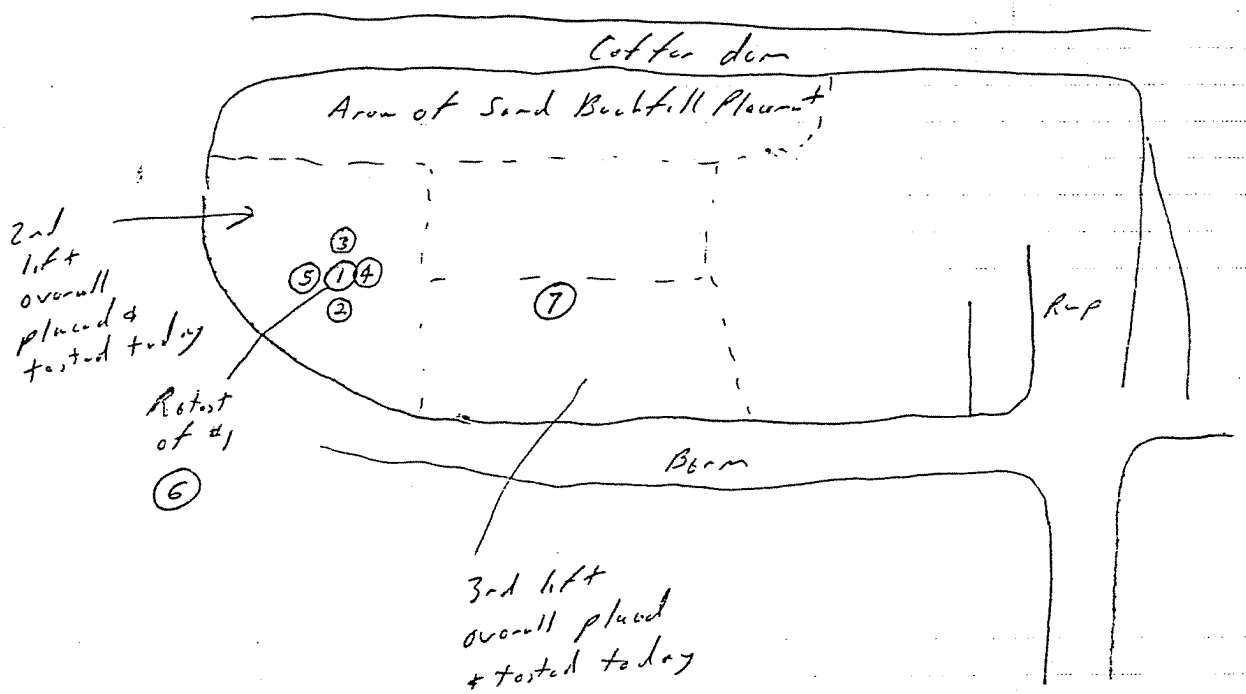
TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Bulkhead Fill Area 2nd lift overall	1st lift today	118.7	13.5	D	103.6	12	
2	North of test No 1	"	115.8	12.3	"	101.1	12	
3	South of test No 1	"	118.9	13.1	"	103.8	12	
4	East of test No 1	"	115.2	14.5	"	100.6	12	
5	West of test No 1	"	119.0	13.8	"	103.9	12	Scarified, water added, compacted prior to testing Torvane Readings: 0.69, 0.38, 0.40, 0.37, 0.39 Avg Torvane: 0.45 x 2.5 = 1.1 kg/cm²
6	Bulkhead Fill Area 2nd lift overall (Retest of No 1)	"	118.2	14.2	D	103.2	12	Torvane Readings: 0.40, 0.42, 0.42, 0.42, 0.40 Avg Torvane: 0.41 x 2.5 = 1.0 kg/cm²
7	Bulkhead Fill Area 3rd lift overall	"	116.4	14.5	D	101.6	12	

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
D	114.5	16.0	Frontier Stone

REMARKS:

Project 102nd Street Landfill — File No. 55099
Location — Date 8/21/96 — By GSK
Subject — Checked — By
Based on — Revised — By

Bulk Head In-place Density Test Location Sketch (not to scale)



CEMSTONE SUPPLY DIV. OF
BUFFALO, NEW YORK 14211-1798

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
8:10	8:25	831	9:00	9:25	:	:

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:
1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

GAL X X TEST TAKEN:

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
16	4118	43	110	3.50	4000 PSI SIZE 57 AE/ASH LA	3.0	21-Aug-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
345000	CERRONE INC\ARMAND		

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
102ND. STREET & RIVER RD.		UNKNOWN		08:30

INSTRUCTIONS
LANDFILL Front Entrance 41

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT PCODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
3.50	3.50	3.50	440572	4000 #57 AE/A 41	YD		

SUB TOTAL
TAX
TOTAL

Report No. DFS-53
INSPECTOR COPY 2

Sheet 4 of 5
Report No. DFS-53

DAILY FIELD SUMMARY

DATE 8/22/96 FILE No. 55099

REPORT No. DFS-54 SHEET 1 of 4

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Occidental CONTRACTOR Smith Env Tech

WEATHER CONDITIONS clear; temp 70 to 85°F; wind moderate

REMARKS

REPORT

9³⁰ Left for the site

10⁰⁰ Arrive at site

Standardize Troxler moisture/density gauge SN 20803

Moisture standard count 645 (-0.3 % var)
Density standard count 2664 (0.1 % var)

Made in-place density tests on Bulkhead material See test results and location sketch.

Collected one bag sample of Frontier stone Material from Bulkhead Area (GB112) 082226-1.

12⁰⁰ Lunch (30 min)

Made in-place density test on storm sewer backfill/perimeter soils along east side of site.

4³⁰ Left the site

REVIEWED BY:
JOHN J. DANZER, P.E.

Field Time
Travel Time
Office Time
Total Time

} See daily accounting summary

GZA

Gary Kawashi
PREPARED BY

REPORT No. DFS-5A

Page 2 of 4

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/22/96
File No. 55029
Technician GTL

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Bulkhead area, Cell 2 See location Sketch, 4th lift overall	1st lift today	113.1	14.8	D	98.7	12	Torvane readings: 0.40, 0.42, 0.39, 0.43, 0.45 Torvane Avg = 0.42 x 2.5 = 1.0 kg/cm²
2	Storm Sewer / Pommott. Soils, East Side of Site Between MH 2 and MH 3	1st lift today	110.6	15.0	A	97.4	8	
3								
4								
5								

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
D	114.5	16.0	Frontier Stone Material
A	113.5	15.0	Love Canal Material / Soil Clay Mixture

REMARKS:

DAILY FIELD SUMMARY

DATE 8/26/96 FILE No. 55099

REPORT No. DFS-56 SHEET 1 of 5

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Occy / OLin CONTRACTOR Smith Env Tech

WEATHER CONDITIONS clear; temp 70 to 85°F; wind light

REMARKS

REPORT

9[10] Left the office.

9[40] Arrive at site.

Standardize Troxler moisture / density gauge SN 20803

Moisture Standard Count 640 (-0.6% Var)
Density Standard Count 2659 (-0.1% Var)

Sand-place moisture density test mid. on storm sewer backfill near MH 5 and Bulkhead material C.11 2

12[00] Lunch (45 min)

5[00] Left the site

Reviewed by:
John J. Danzer, P.E.

Field Time
Travel Time
Office Time
Total Time

} See daily accounting summary.

GZA

Gary Klawinski
PREPARED BY

REPORT No. DFS-56

Page 2 of 5

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/26/96
File No. 55099
Technician GJM

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm Sewer Backfill. 3.5 foot. below Butt Ave. See location plan	1st lift today	118.8	10.6	C	100.9	12	
2	" 4.5 foot below Butt Ave	2nd lift today	105.2	15.9	C	(89.6)	10	
3	Retest of No 2	—	105.5	14.9	C	90.8	12	
4	Storm Sewer Backfill. 5.5 ft below Butt Ave. See location plan	3rd lift today	107.0	12.2	C	90.9	12	
5	" 5ft below Butt Ave	4th lift today	106.2	15.9	C	90.2	12	
6	4 ft below Butt Ave	5th lift today	105.6	14.9	C	90.0	12	
7	3.5 ft below Butt Ave	6th lift today	108.1	16.0	C	91.8	10	
8	3.0 ft below Butt Ave	7th lift today	109.7	15.2	C	93.2	12	
9	2.5 ft below Butt Ave	8th lift today	107.7	16.2	C	91.5	12	
10	2.0 ft below Butt Ave	9th lift today	108.1	16.3	C	91.8	12	
11	Bulkhead area. Col 12. See location plan. 5th lift overall	1st lift today	115.4	15.9	D	100.7	12	• Torvane readings: 0.45, 0.42, 0.38, 0.61 • Avg Torvane = 0.49 (0.57) × 2.5 = 1.2 KS/cm²

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
D	114.5	16.0	Frontier Stone Material
C	117.7	13.6	Grand Island Material

REMARKS:

Report No. DFS-56

Page 3 of 5

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/26/96
File No. 55099
Technician GJK

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
12	Storm Sewer Backfill. 1.5 feet below Buff Ave. See location plan	10th lift today	109.8	15.2	C	93.4	12	
13	1.0 ft below Buff Ave	11th lift today	105.5	15.8	C	90.0	12	
14	0.5 ft below Buff Ave	12th lift today	108.8	15.6	C	92.4	12	
15								
16								
17								
18								

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE

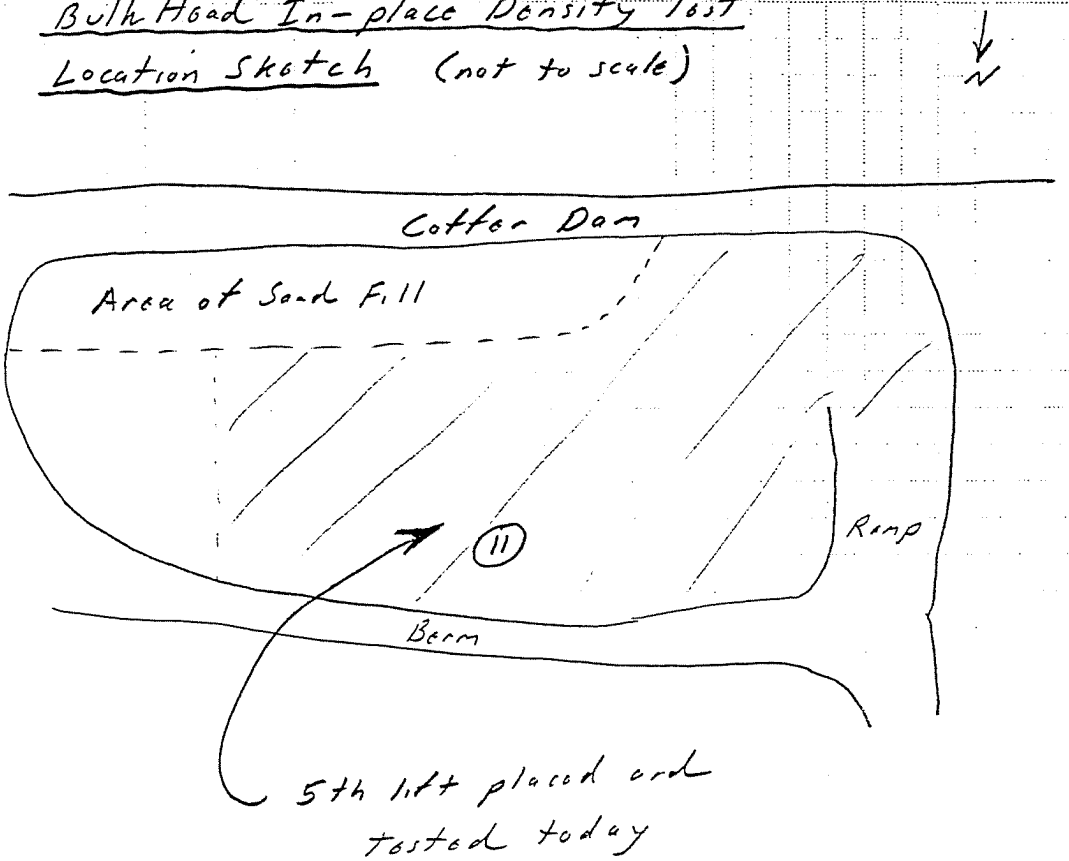
REMARKS:

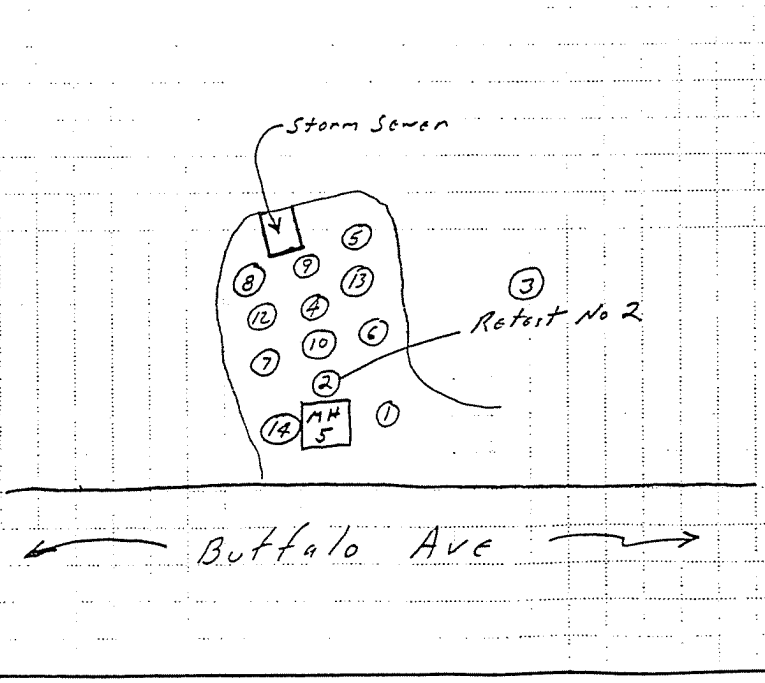
GZA GeoEnvironmental of New York
Engineers and Scientists

REPORT NO. DFS-56

Project	102nd Street Landfill		File No.	55099
Location		Date	8/26/96	By G. Klawinski
Subject		Checked		By
Based on		Revised		By

Bulk Head In-place Density Test Location Sketch (not to scale)





DAILY FIELD SUMMARY

DATE 8/27/96 FILE No. 55099

REPORT No. DFS-57 SHEET 1 of 3

PROJECT 102nd Street Landfill LOCATION Niagara Falls, NY

OWNER Oxy/Olin CONTRACTOR Smith Envir Tech Inc

WEATHER CONDITIONS overcast; rain; temp 60 to 75°F; wind moderate

REMARKS

REPORT

9^15 Left the office

9^45 Arrive at site. Heavy rain 9^45 to 10^45

Complete daily report for 8/26

Standardize Troxler moisture/density gauge SN 20803

Moisture Standard Count 649 (1.1 %Var) } ✓ OK
Density Standard Count 2685 (1.0 %Var) }

12^00 Lunch (45 min)

Made in-place density tests on perimeter soils / storm sewer backfill around MH-1.

Geo-Con started slurry trench excavation at Sta 2+00 moving north.

3^30 Left the site.

4^00 Returned to office.

REVIEWED BY:
JOHN J. DAUZER, P.E.

Field Time ____
Travel Time ____
Office Time ____
Total Time ____

See attached daily accounting summary

GZA

Gary Klawinski
PREPARED BY

REPORT No. DFS-57

IN-PLACE DENSITY TEST RESULTS

Project 102nd Street Landfill
Location Niagara Falls, NY
Contractor Smith

Date 8/27/96
File No. 55099
Technician GJH

TEST NO.	TEST LOCATION	DEPTH OR ELEV.	DRY DENSITY (PCF)	WATER CONTENT (%)	PROCTOR CODE	% PROCTOR DENSITY	TEST DEPTH	REMARKS
1	Storm sewer backfill, 15ft south of MH 1, 2.5ft below top manhole lid	1st lift today	104.3	15.5	A	91.9	12	
2	Storm sewer backfill, 25ft north of MH-1, 2ft below top of manhole lid	2nd lift today	102.5	16.7	A	90.3	12	
3	Storm sewer backfill, 20ft north of MH-1, 1.5ft below MH lid	3rd lift today	111.5	16.8	A	98.2	12	
4								
5								

PROCTOR CODE	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	MATERIAL TYPE AND SOURCE
C	117.7	13.6	Grand Island Material
A	113.5	15.0	Lava Canal Material

REMARKS:

APPENDIX D

CONCRETE QUALITY CONTROL DOCUMENTATION

Quality Inspection Services, Inc.

Corporate Office
186 Warwick Ave. • P.O. Box 732 • Buffalo, New York 14215-0732
(716) 836-0131 • Fax (716) 836-9608

CONCRETE COMPRESSIVE STRENGTH REPORT
ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Environmental Technologies Corp.
Project No.: BT-96-027 Report No.: CT-1A
Supplier: Empire Builders Supply

****

Mix Data: Set No.: #1
Date Molded: 07-23-96 Date Rec'd: 7-29-96
Condition Received: Good
Placement Location: Manhole #2 Invert.

Cubic Yards Placed:
Specimens Cast By: G. Klawinski
Time Specimens Made: Truck No.:
Concrete Temperature: Air Temperature:
Slump: Air Content:
Remarks:
Strength Specification @ 28 Days: 3000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 4999	7-30-96	7	28.27	89220	3150
GZ 5000	8-20-96	28	28.27	151980	5380
GZ 5001	8-20-96	28	28.27	150380	5320

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GZA-BUFFALO

Respectfully Submitted,
Quality Inspection Services, Inc.

Warren, PA Office
920 Pennsylvania Avenue West
Warren, Pennsylvania 16365
Phone and Fax (814) 726-1988

East Syracuse Office
6730 Myers Road
East Syracuse, New York 13057
(315) 431-4291 • Fax (315) 431-4292

For Job Satisfaction - Think Quality

Quality Inspection Services, Inc.

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CONCRETE COMPRESSIVE STRENGTH REPORT
ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Environmental Technologies Corp.
Project No.: BT-96-027 Report No.: CT-2A
Supplier: Empire Builders Supply

****

Mix Data: 4000 PSI AE W/ASH Set No.: #2
Date Molded: 07-26-96 Date Rec'd: 08-02-96
Condition Received: Good
Placement Location: Storm Drain MH-3 Pipe Connection.

Cubic Yards Placed:
Specimens Cast By: J. Danzer
Time Specimens Made: 1:15 PM Truck No.: 109
Concrete Temperature: Air Temperature: 70°
Slump: 2.5" Air Content:
Remarks:
Strength Specification @ 28 Days: 4000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 5044	8-2-96	7	28.27	105020	3700
GZ 5045	8-23-96	28	28.27	139900	4950
GZ 5046	8-23-96	28	28.27	140150	4960

Respectfully Submitted,
Quality Inspection Services, Inc.

FORM #0060

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CONCRETE COMPRESSIVE STRENGTH REPORT

ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Environmental Technologies Corp.
Project No.: BT-96-027 Report No.: CT-3A
Supplier: Empire Builders Supply

****

Mix Data: 4000 PSI AE/ ASM LA Set No.: #3
Date Molded: 08-01-96 Date Rec'd: 08-08-96
Condition Received: Good
Placement Location: Manhole #4 - Pipe Connections.

Cubic Yards Placed: 5
Specimens Cast By: G. Klawinski
Time Specimens Made: 4:00 PM Truck No.: 116
Concrete Temperature: Air Temperature: 80°
Slump: 3.0" Air Content:
Remarks:
Strength Specification @ 28 Days: 4000 PSI

****

COMPRESSIVE STRENGTH DATA

(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 5151	8-5-96	7	28.27	95410	3390
GZ 5152	8-29-96	28	28.27	149630	5290
GZ 5153	8-29-96	28	28.27	144310	5110

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SEP - 3 1996
GZA-BUFFALO

Respectfully Submitted,
Quality Inspection Services, Inc.

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CONCRETE COMPRESSIVE STRENGTH REPORT
ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Environmental Technologies Corp.
Project No.: BT-96-027 Report No.: CT-4A
Supplier: Empire Builders Supply

****

Mix Data: 4000 PSI AE/ ASM LA Set No.: #4
Date Molded: 08-05-96 Date Rec'd: 08-08-96
Condition Received: Good
Placement Location: Manholes #1 and #3 Pipe Connection.

Cubic Yards Placed: 5
Specimens Cast By: G. Klawinski
Time Specimens Made: 2:00 PM Truck No.: 128
Concrete Temperature: _____ Air Temperature: 90°
Slump: 5.0" Air Content: _____
Remarks: _____
Strength Specification @ 28 Days: 4000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 5154	8-12-96	7	28.27	86050	3040
GZ 5155	9-2-96	28	28.27	116310	4110
GZ 5156	9-2-96	28	28.27	118700	4200

James T. Hanafin
Respectfully Submitted,
Quality Inspection Services, Inc.

FORM #0062

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CONCRETE COMPRESSIVE STRENGTH REPORT

ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Environmental Technologies Corp.
Project No.: BT-96-027 Report No.: CT-5A
Supplier: Empire Builders Supply

****

Mix Data: 4000 PSI AE/ ASM LA Set No.: #5
Date Molded: 08-07-96 Date Rec'd: 08-13-96
Condition Received: Good
Placement Location: Pipe Connection to Storm Drain Manhole MM-4.

Cubic Yards Placed: 1
Specimens Cast By: G. Klawinski
Time Specimens Made: 1:30 PM Truck No.: 117
Concrete Temperature: _____ Air Temperature: 85-90°
Slump: 3.5" Air Content: _____
Remarks: _____
Strength Specification @ 28 Days: 4000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	*Date Tested*	*Age (Days)*	*Cross-Sectional Area (in^2)*	*Maximum Load (lbs)*	*Compressive Strength (PSI)*
GZ 5209	*8-14-96*	*7*	*28.27*	*88050*	*3120*
GZ 5210	*9-4-96*	*28*	*28.27*	*130990*	*4630*
GZ 5211	*9-4-96*	*28*	*28.27*	*131850*	*4660*

Respectfully Submitted,
Quality Inspection Services, Inc.

FORM #0062

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CONCRETE COMPRESSIVE STRENGTH REPORT
ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Cerrone Inc / Armond Technologies Corp.
Project No.: BT-96-027 Report No.: CT-6A
Supplier: Empire Builders Supply

****

Mix Data: 4000 PSI AE/ ASM LA Set No.: #6
Date Molded: 08-13-96 Date Rec'd: 08-20-96
Condition Received: Good
Placement Location: Manhole 5 Around Gast Pipe; Manhole 4 Around Mouth Pipe; Manhole 1 Cast Wall Invert/Wall, Part Invest at Manhole 6
Cubic Yards Placed: 2.5
Specimens Cast By: G. Klawinski
Time Specimens Made: 11:00 AM Truck No.: 117
Concrete Temperature: Air Temperature:
Slump: 2.5" Air Content:
Remarks:
Strength Specification @ 28 Days: 4000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 5246	8-20-96	7	28.27	114100	4040
GZ 5247	9-10-96	28	28.27	152340	5390
GZ 5248	9-10-96	28	28.27	154510	5470

James T. Hargett
Respectfully Submitted,
Quality Inspection Services, Inc.

FORM #0062

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CONCRETE COMPRESSIVE STRENGTH REPORT
ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Envornmental
Project No.: BT-96-027 Report No.: CT-7A
Supplier: Empire Builders Supply

****

Mix Data: 57 AE/A 41 Set No.: #7
Date Molded: 09-11-96 Date Rec'd: 09-17-96
Condition Received: Good
Placement Location: Head Wall at South End of Storm Sewer (Bottom Concrete Pad)
Cubic Yards Placed: 4.5
Specimens Cast By: G. Klawinski
Time Specimens Made: 3:00 PM Truck No.: 126
Concrete Temperature: 78° Air Temperature: 80°
Slump: 3.5" Air Content: 4.6%
Remarks:
Strength Specification @ 28 Days: 4000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 5541	9-18-96	7	28.27	101450	3590
GZ 5542	9-18-96	7	28.27	95370	3370
GZ 5543	10-8-96	28	28.27	148850	5270
GZ 5544	10-8-96	28	28.27	141770	5020
GZ 5545	Hold	H			
GZ 5546	Hold	H			

James T. Hargill
Respectfully Submitted,
Quality Inspection Services, Inc.

FORM #0062

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CONCRETE COMPRESSIVE STRENGTH REPORT
ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Envornmental
Project No.: BT-96-027 Report No.: CT-8A
Supplier: Empire Builders Supply

****

Mix Data: 57 AE/A 40 Set No.: #8
Date Molded: 09-18-96 Date Rec'd: 09-24-96
Condition Received: Good
Placement Location: Head Wall at South End of Storm Sewer (Wall & Pipe)
Cubic Yards Placed: 1.5
Specimens Cast By: T.Seider
Time Specimens Made: 1:30 PM Truck No.: 133
Concrete Temperature: 72° Air Temperature: 70°
Slump: 1.75" Air Content: 4.1%
Remarks:
Strength Specification @ 28 Days: 4000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 5622	9-25-96	7	28.27	109580	3880
GZ 5623	9-25-96	7	28.18	112290	3980
GZ 5624	10-16-96	28	28.27	158130	5590
GZ 5625	10-16-96	28	28.27	138440	4900
GZ 5626	Hold	H			
GZ 5627	Hold	H			

James T. Hand
Respectfully Submitted,
Quality Inspection Services, Inc.

FORM #0062

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920 Pennsylvania Avenue West
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CONCRETE COMPRESSIVE STRENGTH REPORT
ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Envornmental
Project No.: BT-96-027 Report No.: CT-9A
Supplier: American Concrete

****

Mix Data: Batch 4491 / Mix 4 Set No.: #9
Date Molded: 09-19-96 Date Rec'd:
Condition Received: Good
Placement Location: North End Plug on Storm Sewer.

Cubic Yards Placed: 6.5
Specimens Cast By: G. Klawiaski
Time Specimens Made: 1:30 PM Truck No.: 217
Concrete Temperature: 70° Air Temperature: 75°
Slump: 3.0" Air Content: 4.5%
Remarks:
Strength Specification @ 28 Days: 3000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 5600	9-26-96	7	28.27	76010	2690
GZ 5601	9-26-96	7	28.27	86480	3060
GZ 5602	10-17-96	28	28.27	114810	4060
GZ 5603	10-17-96	28	28.27	130850	4630
GZ 5604	Hold	H			
GZ 5605	Hold	H			

Respectfully Submitted,
Quality Inspection Services, Inc.

FORM #0062

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CONCRETE COMPRESSIVE STRENGTH REPORT
ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Envornmental
Project No.: BT-96-027 Report No.: CT-10A
Supplier: Empire Concrete

****

Mix Data: #57 AE/A 40 Set No.: #10
Date Molded: 09-20-96 Date Rec'd: 09-27-96
Condition Received: Good
Placement Location: East & West Wing Walls at South End of New Storm Sewer.
Cubic Yards Placed: 1.5
Specimens Cast By:
Time Specimens Made: 1:20 PM Truck No.: 4699
Concrete Temperature: 78° Air Temperature: 80°
Slump: 2.0" Air Content: 4.5%
Remarks:
Strength Specification @ 28 Days: 3000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 5678	9-27-96	7	28.27	132490	4690
GZ 5679	9-27-96	7	28.27	126520	4480
GZ 5680	10-18-96	28	28.27	172960	6120
GZ 5681	10-18-96	28	28.27	175770	6220
GZ 5682	Hold	H			
GZ 5683	Hold	H			

James T. Hargl

Respectfully Submitted,
Quality Inspection Services, Inc.

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CONCRETE COMPRESSIVE STRENGTH REPORT
ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Envornmental
Project No.: BT-96-027 Report No.: CT-11A
Supplier: American Concrete

****

Mix Data: 4 Set No.: #11
Date Molded: 09-20-96 Date Rec'd: 09-27-96
Condition Received: Good
Placement Location: South End Storm Sewer Line Plug. (Old Storm Sewer Line)
Cubic Yards Placed: 8.5
Specimens Cast By:
Time Specimens Made: 3:30 PM Truck No.: 207
Concrete Temperature: 78° Air Temperature: 80°
Slump: 2.0" Air Content: 5.0%
Remarks:
Strength Specification @ 28 Days: 3000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 5669	9-27-96	7	28.27	853500	3020
GZ 5670	9-27-96	7	28.27	827000	2930
GZ 5671	10-18-96	28	28.27	126860	4490
GZ 5672	10-18-96	28	28.27	128750	4550
GZ 5673	Hold	H			
GZ 5674	Hold	H			

Respectfully Submitted,
Quality Inspection Services, Inc.

FORM #0062

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CONCRETE COMPRESSIVE STRENGTH REPORT
ASTM C-39

Project: 102nd Street Remediation
Client: GZA - GEO Environmental of NY
Contractor: Smith Envornmental
Project No.: BT-96-027 Report No.: CT-12A
Supplier: Empire Builders Supply

****

Mix Data: 4000 PSI Set No.: #12
Date Molded: 11-26-96 Date Rec'd: 12-03-96
Condition Received: Good
Placement Location: Catch Basin Along Buffalo Avenue

Cubic Yards Placed: 2
Specimens Cast By: TRS
Time Specimens Made: 3:00 PM Truck No.: 125
Concrete Temperature: 55° Air Temperature: 30°
Slump: 3.0" Air Content:
Remarks:
Strength Specification @ 28 Days: 4000 PSI

****

COMPRESSIVE STRENGTH DATA
(Cylinder Size: 6" x 12" Unless Otherwise Noted)

Laboratory Number	Date Tested	Age (Days)	Cross-Sectional Area (in^2)	Maximum Load (lbs)	Compressive Strength (PSI)
GZ 6450	12-03-96	7	28.37	87710	3090
GZ 6451	12-24-96	28	28.27	145620	5150

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Respectfully Submitted
Quality Inspection Services, Inc.

FORM #0062

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For Job Satisfaction - Think Quality

CUSTOMER COPY

PUMPCRETE

TERMS NET 15 DAYS

CONTROL NO. 4038

(CO. USE ONLY) **INVOICE NO.**

CUST.NO. | | | | | |

DATE MO DY YR 10/4/96

CONTRACTOR SMITH

ADDRESS

P.C.

OFFICE PHONE NO.

OPERATOR ON JOB 800 LEFT JOB 100

JOB ADDRESS BUFFALO AVE

JOB START

SYSTEM REQUIRED BOOM

MATERIAL PUMPED GROUT SLUMP

SUPPLIER AMERICAN

DAMAGE

DOWN TIME

REASON

BOOM SIZE 28

MORE WORK ON THIS PROJECT Y ☐ N ☐

ACCEPTED BY

NAME (PLEASE PRINT)

RENTAL CONTRACT CONDITIONS: Paul Pagano

DESCRIPTION	HOURS		RATE	$	TOTALS
OPERATOR REG.		X		=	
OP. OVERTIME		X	.	=	
HELPER REG. Y ☐ N ☐		X	.	=	
HELP. OVERTIME		X	.	=	
				LABOUR TOTAL	
TRAVEL TIME	1	X	.	=	
MACH. RENTAL	5	X	.	=	
VOL. PUMPED	88	X	.	=	
RADIOS		X	.	=	
MISC CHARGES				=	
				MACHINE TOTAL	
				NET TOTAL	
				Tax @ %	
				Tax @ %	
				TOTAL AMOUNT	

The contractor agrees to furnish water to concrete pump, accept responsibility for delays caused by varying job conditions, improper scheduling of trucks, changes in graduation of aggregate or incorrect batching of concrete.

Back charges are not accepted for machine down time, lost concrete, costs due to uncompleted pours or equipment failure if stand-by pump is not hired.

Overtime hours are charged as defined in the local prevailing Union Agreement.

The above signed customer by placing of this order or the acceptance of this invoice agrees to pay reasonable attorney's fees. 18% interest charges and collection charges in the event action hereinafter becomes necessary for the collection of the due value of the work herein authorized.

AMERICAN CONCRETE
500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

DISPATCH: 439-8323
OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	8:30	##########	9:20	9:30	##########

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

40 GAL X Plant Water X TEST TAKEN:

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008362	2	201	8.00	GROUT MIX 32	4.5	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH,CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA.FALLS		MISC.	ROBERT T.	09:00

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	8.00	80.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 5160 LOAD SIZE 8.00 FORMULA 32 TIME 08:13:41
TRUCK NO 201 01/01 BSZ 8.00 CODE 32 DATE 10/04/96
WAT TRIM + 10.0
AGG 02 22950 LB MC 6.1
CEM 01 3760 LB
WATER 271 GL

SUB TOTAL
TAX
TOTAL

TIME 08:17:42
END TARES 00 OZ AGG 100 LB CEM 00 LB WAT 00 GL
MXE 00 OZ MXF 00 OZ MXG 00 OZ

CONCRETE DELIVERY TICKET

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
		9:00		:	:	

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

70 GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008363	2	202	8.00	GROUT MIX 32	4.5	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915000	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	[illegible]	09:02

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	16.00	80.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 5169 LOAD SIZE 8.00 FORMULA [illegible] TIME 08:18:53
TRUCK NO 202 01/01 DSZ 8.00 CODE 32 DATE 10/04/96
~~WAT 15TH 10.0~~
AGG 02 23000 LB MC 6.1

CEM 01 3790 LB
WATER 271 GL

SUBTOTAL
TAX
TOTAL

TIME 08:24:24
END TARES

AGG	50 LB	CEM	10 LB	WAT	00 GL		
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

CONCRETE DELIVERY TICKET

AMERICAN CONCRETE
500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	:	:	:	:	:

WARNING

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008364	2	204	8.00	GROUT MIX 32	4.5	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH,CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA.FALLS		MISC.	~~MARK T.~~ DAN.	09:07

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	OUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	24.00	80.00	GROUT	GROUT MIX 32	YD		

SUB TOTAL

BATCH NO. 5170 LOAD SIZE 8.00 FORMULA 32 TIME 08:26:41
TRUCK NO 204 01/01 BSZ 8.00 CODE 32 DATE 10/04/96
WAT TRIM + 10.0 TOTAL
AGG 02 23100 LB MC 6.1

CEM 01 3740 LB
WATER 271 GL

TIME 08:31:16
END TARES

AGG	50 LB	CEM	10 LB	WAT	00 GL		
AX4	00 OZ	AX5	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

CONCRETE DELIVERY TICKET

AMERICAN CONCRETE
500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	:	##########	:	:	##########

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008366	2	210	8.00	GROUT MIX-32	4.5 10	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH,CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA.FALLS		MISC.	PAT M.	09:13

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	32.00	80.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 5172 LOAD SIZE 0.00 FORMULA 32 TIME 08:30:00
TRUCK NO 210 01/01 RSZ 8.00 CODE 32 DATE 10/04/96
WAT TRIM 10.0
AGG 02 23000 LB MC 6.1
CEM 01 3740 LB
WATER 271 GL

SUB TOTAL
TAX
TOTAL .

TIME 00:42:47
END TARES

AGG	100 LB	CEM	10 LB	WAT	00 GL	AXA	00 OZ
AXB	00 OZ	AXC	00 OZ	AXD	00 OZ	AXE	00 OZ
AXF	00 OZ	AXG	00 OZ				

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	:	##########	:	:	##########

WARNING

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_____ GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008368	2	200	8.00	GROUT MIX-32	4.5	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915000	SMITH ENVIRONMENTAL TECH. CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9029 BUFFALO AVE - NIA. FALLS		MISC.	KEVIN S.	09:26

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE. (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	40.00	00.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 5174 LOAD SIZE 8.00 FORMULA 32 TIME 00:52:05
TRUCK NO 200 01/01 BSZ 8.00 CODE 32 DATE 10/04/96
WAT TRIM + 10.0
AGG 02 23100 LB MC 6.1

CEM 01 3750 LB
WATER 271 GL

SUB TOTAL
TAX
TOTAL

TIME 00:56:07
END TARES

AGG	100 LB	CEM	20 LB	WAT	00 GL		
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

CONCRETE DELIVERY TICKET

AMERICAN CONCRETE
500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	09 : 40	##########	:	:	##########

WARNING

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20 GAL X _____ X _____ TEST TAKEN: NO

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008370	2	205	8.00	GROUT MIX 32	4.5	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	BOB M.	09:40

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	48.00	80.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 5176 LOAD SIZE 8.00 FORMULA 32 TIME 09:06:21
TRUCK NO 205 01/01 RSZ 8.00 CODE 32 DATE 10/04/96
WAT TRIM + 10.0
AGG 02 23050 LB MC 6.1

CEM 01 3740 LB
WATER 272 GL

SUB TOTAL
TAX
TOTAL

TIME 09:11:07
END TARES

AGG	100 LB	CEM	20 LB	WAT	00 GL		
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

CONCRETE DELIVERY TICKET

CUSTOMER COPY

AMERICAN CONCRETE
500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	10:00	:	10:35	10:50	:

WARNING

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008375	2	206	8.00	GROUT MIX 32	4.5	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH,CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9029 BUFFALO AVE - NIA.FALLS		MISC.	FRED A.	09:18

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	56.00	80.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 5101 LOAD SIZE 8.00 FORMULA 32 TIME 09:31:43
TRUCK NO 206 01/01 RSZ 8.00 CODE 32 DATE 10/04/96
WAT TRIM + 12.9
AGG 02 12950 LB MC 6.1
CEM 01 3740 LB
WATER 287 GL

SUB TOTAL
TAX
TOTAL

TIME 09:41:03
END TARES
AXA 00 OZ AXD 100 LB CEM 20 LB WAT 00 GL
AXE 00 OZ AXF 00 OZ AXG 00 OZ AXC 00 OZ AXD 00 OZ

CONCRETE DELIVERY TICKET

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	10:20 :	:	10:45 :	10:55 :	:

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50 GAL X [illegible] X TEST TAKEN:

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008377	2	201	8.00	GROUT MIX 32	4.5	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915000	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	ROBERT T.	10:15

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	64.00	00.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 5103 LOAD SIZE 8.00 FORMULA
TRUCK NO 201 01/01 BSZ 8.00 CODE
WAT TRIM + 12.0
AGG 02 23600 LB MC 8.0

CEM 01 3740 LB
WATER 230 GL

TIME 09:55:15
DATE 10/04/96

SUBTOTAL
TAX
TOTAL

TIME 09:59:16
END TAKES

AGG	100 LB	CEM	10 LB	WAT	00 GL		
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

CONCRETE DELIVERY TICKET

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

FAX:

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	10:30	##########	:	:	##########

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TEST TAKEN:

80 GAL X _____ X _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008378	2	202	8.00	GROUT MIX 32	4.5	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	LEROY S.	10:41

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	72.00	00.00	GROUT MIX 32	GROUT MIX 32	YD		

BATCH NO. 5104 LOAD SIZE 8.00 FORMULA 32 TIME 10:01:37
TRUCK NO 202 01/01 RSZ 8.00 CODE 32 DATE 10/04/96
WAT TRIM 12.0
AGG 02 23500 LB MC 8.0

CEM 01 3790 LB
WATER 230 GL

SUB TOTAL
TAX
TOTAL

TIME 10:06:31
END TARES
AXA 00 OZ
AXE 00 OZ

AGG 100 LB
AXB 00 OZ
AXF 00 OZ

CEM 10 LB
AXC 00 OZ
AXG 00 OZ

WAT 00 GL
AXD 00 OZ

CONCRETE DELIVERY TICKET

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-0320
FAX: 439-0158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	:	:	:	:	:

WARNING

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008301	32	210	8.00	GROUT MIX 32	4.5	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915000	SMITH ENVIRONMENTAL TECH, CORP.	GORALN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9029 BUFFALO AVE - NIA.FALLS		MISC.	PAT	11:06

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	80.00	80.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 0107 LOAD SIZE 8.00 FORMULA 32 TIME 10:12:01
TRUCK NO 210 01/01 BSZ 8.00 CODE 32 DATE 10/04/96
WAT TRIM 4 15.0
AGG 02 23050 LB MC 6.5

CEM 01 3000 LB
WATER 275 GL

TOTAL

TIME 10:24:50
END TARES AGG 100 LB CEM 10 LB WAT 00 GL
AXA 00 OZ AXB 00 OZ AXC 00 OZ AXD 00 OZ
AXE 00 OZ AXF 00 OZ AXG 00 OZ

Dataforms, West Seneca, NY (716) 675-6839
CONCRETE DELIVERY TICKET

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	11 :38	##########	:	:	##########

WARNING

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1008386	2	203	8.00	GROUT MIX 32	4.5	04-Oct-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9A29 BUFFALO AVE - NIA. FALLS		MISC.	DAVE R.	11:06

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	88.00	88.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 5191 LOAD SIZE 8.00 FORMULA 32
TRUCK NO 203 01/01 0SZ 8.00 CODE 32
WAT TRIM 12.0
AGG 02 23150 LB MC 6.5

CEM 01 3790 LB
WATER 275 GL

TIME 10:54:53
DATE 10/04/96

SUB TOTAL
TAX
TOTAL

TIME 10:50:57
END TAKES

AGG	00 LB	CEM	10 LB	WAT	00 GL		
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

CONCRETE DELIVERY TICKET

PUMPCRETE®

TERMS NET 15 DAYS

CONTROL NO. 3992

(CO. USE ONLY) INVOICE NO.

CUST.NO. | | | | | |

DATE (MO DY YR) 6 9 12 96

CONTRACTOR SMST FMC.M.

ADDRESS

P.C.

OFFICE PHONE NO.

OPERATOR ON JOB 8 30 LEFT JOB 1 30

JOB ADDRESS RIVER RD

JOB START

SYSTEM REQUIRED BOOM + 42" PIPE

MATERIAL PUMPED GROUT SLUMP

SUPPLIER AMERICAN

DAMAGE 1 5" CLAMP

DOWN TIME 1 45° - 5"

REASON

BOOM SIZE 28M

MORE WORK ON THIS PROJECT Y ☐ N ☐

ACCEPTED BY

NAME (PLEASE PRINT) Eric Green

DESCRIPTION	HOURS		RATE	$	TOTALS
OPERATOR REG.		X		=	
OP. OVERTIME		X	.	=	
HELPER REG. Y ☐ N ☐		X	.	=	
HELP. OVERTIME		X	.	=	
				LABOUR TOTAL	
TRAVEL TIME	0	X	.	=	
MACH. RENTAL	5	X	.	=	
VOL. PUMPED	160	X	.	=	
RADIOS		X	.	=	
MISC CHARGES				=	
				MACHINE TOTAL	
				NET TOTAL	
				Tax @ %	
				Tax @ %	
				TOTAL AMOUNT	

RENTAL CONTRACT CONDITIONS:

The contractor agrees to furnish water to concrete pump, accept responsibility for delays caused by varying job conditions, improper scheduling of trucks, changes in graduation of aggregate or incorrect batching of concrete.

Back charges are not accepted for machine down time, lost concrete, costs due to uncompleted pours or equipment failure if stand-by pump is not hired.

Overtime hours are charged as defined in the local prevailing Union Agreement.

The above signed customer by placing of this order or the acceptance of this invoice agrees to pay reasonable attorney's fees, 18% interest charges and collection charges in the event action hereinafter becomes necessary for the collection of the due value

5W0 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	:	##########	:	:	##########

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007902	1	200	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915000	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9029 BUFFALO AVE - NIA. FALLS		MISC.	BILL F.	09:00

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	8.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4715 LOAD SIZE 8.00 FORMULA 32 TIME 08:25:32
TRUCK NO 200 01/01 OZ 0.00 CODE 32 DATE 09/24/96

WAT TRIM + 5.5
AGG 02 23000 LB MC 5.6

CEM 01 3790 LB
WATER 210 GL

SUB TOTAL
TAX
TOTAL

TIME 00:30:45
END TARES AGG 100 LB CEM 10 LB WAT 00 GL
AXA 00 OZ AXB 00 OZ AXC 00 OZ AXD 00 OZ
AXE 00 OZ AXF 00 OZ AXG 00 OZ

Eric Green

CUSTOMER COPY

CONCRETE DELIVERY TICKET

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	9:00	##########	:	:	##########

WARNING

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007904	1	201	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA.FALLS		MISC.	ROBERT T.	09:10

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	16.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4717 LOAD SIZE 8.00 FORMULA 32 TIME 08:41:32
TRUCK NO 201 01/01 RSZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 22850 LB MC 5.6
CEM 01 3780 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

TIME 08:46:11
END TARES AGG 50 LB CEM 10 LB WAT 00 GL
AXA 00 OZ AXB 00 OZ AXC 09 OZ AXD 00 OZ
AXE 00 OZ AXF 00 OZ AXG 00 OZ

Eric Green

CONCRETE DELIVERY TICKET

300 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	09 : 15	##########	:	:	##########

WARNING

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_____ GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007906	1	205	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	BOB M.	09:15

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	24.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4719 LOAD SIZE 8.00 FORMULA 32 TIME 08:53:28
TRUCK NO 205 01/01 BSZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6
CEM 01 3770 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

TIME 08A00$16 AGG 50 LB CEM 00 LB WAT 00 GL
AXA 00 OZ AXB 00 OZ AXC 00 OZ AXD 00 OZ
AXE 00 OZ AXF 00 OZ AXG 00 OZ

E Z

CUSTOMER COPY

CONCRETE DELIVERY TICKET

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	9 :[illegible]	##########	9 :55	:	########

WARNING

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10 GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	100791	1	215	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915000	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	PAT M.	09:25

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	32.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4723 LOAD SIZE 8.00 FORMULA 32 TIME 09:26:31
TRUCK NO 0 01/01 RSZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 23000 LB MC 5.6
CEM 01 3750 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

TIME 09:30:03
END TARES

AGG	100 LB	CEM	20 LB	WAT	00 GL		
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

EJ

CUSTOMER COPY

CONCRETE DELIVERY TICKET

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	9:54	##########	:	:	##########

WARNING

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_____ GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007912	1	219	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9029 BUFFALO AVE - NIA.FALLS		MISC.	JOE P.	10:00

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	40.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4724 LOAD SIZE 8.00 FORMULA 32 TIME 09:30:44
TRUCK NO 219 01/01 RSZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6

CEM 01 3740 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

CONCRETE DELIVERY TICKET

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	:	:	:	:	:

WARNING

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007913	1	204	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9029 BUFFALO AVE - NIA.FALLS		MISC.	KEVIN S.	10:05

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	48.00	200.00	GROUT	GROUT MIX 32	YD		

TAMEH09M05:24725 LOAD SIZE 8.00 FORMULA 32 TIME 09:37:44
ENDCK TARES 204 00001 BSZ 50.00 CODE 20 00 DATE 09/24/00 GL
DWM TRIM +00500 AXB 00 OZ AXC 00 OZ AXD 00 OZ
AWG 02 23000 OB MAXF5.6 00 OZ AXG 00 OZ SUB TOTAL
TAX
TOTAL

CEM 01 3740 LB
WATER 326 GL

TIME 09:42:55
END TARES AGG 100 LB CEM 10 LB WAT 00 GL
AXA 00 OZ AXB 00 OZ AXC 00 OZ AXD 00 OZ
AXE 00 OZ AXF 00 OZ AXG 00 OZ

CONCRETE DELIVERY TICKET

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	10:00	##########	10:13	10:15	##########

WARNING

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1 2 GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007914-1	1	216	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9029 BUFFALO AVE - NIA.FALLS		MISC.	RICH J.	10:12

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	56.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4726 LOAD SIZE 8.00 FORMULA 32 TIME 09:43:46
TRUCK NO 216 01/01 RSZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6

CEM 01 3760 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

TIME 09:48:05
END TARES
AGG 00 LB CEM 20 LB WAT 00 GL
AXA 00 OZ AXB 00 OZ AXC 00 OZ AXD 00 OZ
AXE 00 OZ AXF 00 OZ AXG 00 OZ

EA

CONCRETE DELIVERY TICKET

CUSTOMER COPY

[illegible]
500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

DISPATCH: 439-8320
OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	10 :15	:	:	:	:

WARNING

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007915	1	203	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915000	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	~~[illegible]~~ DAVE	10:18

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	64.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4727 LOAD SIZE 8.00 FORMULA 32 TIME 09:49:09
TRUCK NO 203 01/01 DSZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 23050 LB MC 5.6

CEM 01 3790 LB
WATER 326 GL

SUB TOTAL
TAX
TOTAL

TIME 09:53:42
END TARES

AGG		00 LB	CEM		20 LB	WAT		00 GL
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

EZ

CONCRETE DELIVERY TICKET

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	10:15	:	10:30	:	:

WARNING

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CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

GAL X _____ X Eric Green TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007916	1	214	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9029 BUFFALO AVE - NIA. FALLS		MISC.	~~DAVE R~~ Larry.	10:23

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	72.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4720 LOAD SIZE 8.00 FORMULA 32 TIME 09:55:00
TRUCK NO 214 01/01 BSZ 8.00 CODE 32 DATE 02/24/96
WAT TRIM + 15.0
AGG 02 23000 LB MC 5.6

CEM 01 3740 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

TIME 09:59:32
END TARES

AXA	00 OZ	AXB	00 LB	AXC	10 LB	AXD	00 GL
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		00 OZ

CONCRETE DELIVERY TICKET

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

DISPATCH: 439-8323
OFFICE: 439-8320
FAX: 439-8158

CONCRETE DELIVERY TICKET

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	10 : 30	:	10 : 45	11 : 00	:

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

GAL X _____ X Eric Green TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007917	1	202	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA.FALLS		MISC.	LEROY S.	10:29

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	80.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4729 LOAD SIZE 8.00 FORMULA 32 TIME 10:10:05
TRUCK NO 200 01/01 BSZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6

CEM 01 3740 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

TIME 10:15:11
END TARES
AGG 00 LB CEM 10 LB WAT 00 GL
AXA 00 OZ AXB 00 OZ AXC 00 OZ AXD 00 OZ
AXE 00 OZ AXF 00 OZ AXG 00 OZ

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	10:30	##########	:	:	##########

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

_____ GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007918	1	202	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915000	SMITH ENVIRONMENTAL TECH. CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9029 BUFFALO AVE - NIA. FALLS		MISC.	LEROY S.	10:52

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	88.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4730 LOAD SIZE 8.00 FORMULA 32 TIME 10:15:56
TRUCK NO 202 01/01 RSZ 8.00 CODE 32 DATE 09/24/96

WAT TRIM + 15.0
AGG 02 22950 LB MC 5.6

CEM 01 3740 LB
WATER 326 GL

SUB TOTAL
TAX
TOTAL

TIME 10:20:30
END TARES

AGG	00 LB	CEM	10 LB	WAT	00 GL		
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

EJ

CONCRETE DELIVERY TICKET

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
		10:45		11:00	11:45	

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

GAL X _____ X Eric Green TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007920	1	206	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA.FALLS		MISC.	FRED A.	10:52

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T. NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	96.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4732 LOAD SIZE 8.00 FORMULA 32 TIME 10:26:16
TRUCK NO 206 01/01 RSZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 22950 LB MC 5.6

CEM 01 3740 LB
WATER 326 GL

SUB TOTAL
TAX
TOTAL

TIME 10:30:34
END TARES

AGG	50 LB	CEM	10 LB	WAT	00 GL	AXA	00 OZ	AXB	00 OZ
AXC	00 OZ	AXD	00 OZ	AXE	00 OZ	AXF	00 OZ	AXG	00 OZ

CONCRETE DELIVERY TICKET

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	10 : 50	##########	11 : 05	11 : 15	##########

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
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5. If irritation persists, get medical attention promptly.
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CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

12 GAL X _____ X _____ TEST TAKEN: Yes

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007921	1	205	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA.FALLS		MISC.	BOB M.	10:57

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	104.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4733 LOAD SIZE 8.00 FORMULA 32 TIME 10:35:40
TRUCK NO 205 01/01 BSZ 8.00 CODE 32 DATE 09/24/96

WAT TRIM + 15.0
AGG 02 23000 LB MC 5.6

CEM 01 3760 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

TIME 10:39:33
END TARES

AXA	00 OZ	AGG	00 LB	CEM	20 LB	WAT	00 GL
AXE	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
		AXF	00 OZ	AXG	00 OZ		

EP

CONCRETE DELIVERY TICKET

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

DISPATCH 439-8320
OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	11 : 05	:	11 : 20	:	:

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

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10 GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007923	1	215	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800,	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	PAT M.	11:12

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	112.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4734 LOAD SIZE 8.00 FORMULA 32 TIME 10:40:37
TRUCK NO 215 01/01 DSZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6
CEM 01 3740 LB
WATER 326 GL

SUB TOTAL
TAX
TOTAL

TIME 10:53:01
END TARES
AXA 00 OZ AGG 00 LB CEM 20 LB WAT 00 GL
AXE 00 OZ AXB 00 OZ AXC 00 OZ AXD 00 OZ
AXF 00 OZ AXG 00 OZ

CONCRETE DELIVERY TICKET

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	:	:	:	:	:

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

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3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
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6. Keep children away.

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007925	1	204	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH,CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA.FALLS		MISC.	KEVIN S.	11:30

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	120.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4737 LOAD SIZE 8.00 FORMULA 32 TIME 11:03:44
TRUCK NO 200 01/01 BSZ 8.00 CODE 32 DATE 09/24/96

WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6

CEM 01 3760 LB
WATER 326 GL

SUB TOTAL
TAX
TOTAL

TIME 11:07:42
END TARES

AGG	00 LB	CEM	10 LB	WAT	00 GL
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

CONCRETE DELIVERY TICKET

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8520
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	:	:	:	:	

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

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3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
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5. If irritation persists, get medical attention promptly.
6. Keep children away.

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GAL X _____ X Eric Green TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007927	1	203	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9A29 BUFFALO AVE - NIA. FALLS		MISC.	DAVE	11:42

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	120.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4739 LOAD SIZE 8.00 FORMULA 32 TIME 11:13:46
TRUCK NO 203 01/01 RSZ 8.00 CODE 32 DATE 09/24/96

WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6

CEM 01 3770 LB
WATER 326 GL

SUB TOTAL
TAX
TOTAL

TIME 11:17:42
END TARES

AGG	00 LB	CEM	20 LB	WAT	00 GL		
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

CONCRETE DELIVERY TICKET

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
########	########	12:00	########	:	:	########

WARNING

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1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
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5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

_____ GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007920	1	218	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	JOHN J.	11:40

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	136.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4740 LOAD SIZE 8.00 FORMULA 32 TIME 11:25:07
TRUCK NO 218 01/01 BSZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6

CEM 01 3740 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

TIME 11:34:30
END TARES
AGG 00 LB CEM 20 LB WAT 00 GL
AXA 00 OZ AXB 00 OZ AXC 00 OZ AXD 00 OZ
AXE 00 OZ AXF 00 OZ AXG 00 OZ

EL

CONCRETE DELIVERY TICKET

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

DISPATCH: 439-8323
OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	:	##########	12:40	12:45	##########

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

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GAL X _____ X Eric Green TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007929	1	214	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	LARRY W.	12:09

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	144.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4741 LOAD SIZE 8.00 FORMULA 32 TIME 11:35:06
TRUCK NO 214 01/01 8SZ 8.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6

CEM 01 3770 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

TIME 11:41:29
END TARES

AXA	00 OZ	AGG	00 LB	CEM	20 LB	WAT	00 GL
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ	AXD	00 OZ

CONCRETE DELIVERY TICKET

CUSTOMER COPY

500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	:	:	:	:	:

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007931	1	200	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915000	SMITH ENVIRONMENTAL TECH,CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA.FALLS		MISC.	BILL F.	12:09

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA.FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	152.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4743 LOAD SIZE 8.00 FORMULA 32 TIME 11:45:33
TRUCK NO 200 01/01 USZ 0.00 CODE 32 DATE 09/24/96
WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6

CEM 01 3760 LB
WATER 326 GL

SUB TOTAL
TAX
TOTAL

TIME 11:49:40
END TARES

AGG	50 LB	CEM	10 LB	WAT	00 GL
AXA	00 OZ	AXB	00 OZ	AXC	00 OZ	AXD	00 OZ
AXE	00 OZ	AXF	00 OZ	AXG	00 OZ		

CUSTOMER COPY

CONCRETE DELIVERY TICKET

AMERICAN CONCRETE
500 RICHFIELD STREET
LOCKPORT, NEW YORK 14094

DISPATCH: 439-8325
OFFICE: 439-8320
FAX: 439-8158

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
##########	##########	12:05	##########	:	:	##########

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

GAL X _____ X Eric Green TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	100732	1	202	8.00	GROUT MIX 32	5.0	24-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915800	SMITH ENVIRONMENTAL TECH, CORP.	GORDEN	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9829 BUFFALO AVE - NIA. FALLS		MISC.	LEROY S.	12:15

INSTRUCTIONS
LOCKPORT RD L/T WALMORE RD R/T NIA. FALLS RD L/T WILLIAMS RD R/T BUFFALO AVE (HARD HAT & SAFETY GLASSES MUST BE WORN ON JOBSITE)

32

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
8.00	160.00	200.00	GROUT	GROUT MIX 32	YD		

BATCH NO. 4744 LOAD SIZE 8.00 FORMULA 32 TIME 11:49:50
TRUCK NO 202 01/01 RSZ A.00 CODE 32 DATE 09/24/96

WAT TRIM + 15.0
AGG 02 22900 LB MC 5.6

CEM 01 3760 LB
WATER 325 GL

SUB TOTAL
TAX
TOTAL

TIME 11:56:32
END TARES 00 OZ AXB 00 OZ AXB 00 OZ AXB 00 OZ

CONCRETE DELIVERY TICKET

EASTERN AGGREGATES SUPPLY DIV. OF
BUFFALO, NEW YORK 14211-1798

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
8:57	9:05	9:25	10:00	10:40	:	:

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

GAL X _____ X _____ TEST TAKEN: X

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
16	3437	JP	100	7.50	4000 PSI SIZE 57 AE/AIR IA	3.0	27-Jul-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
345000	CERRONE INC/ARMAND	96-E	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
LANDFILL - 102ND AND BUFFALO		UNKNOWN		09:30

INSTRUCTIONS
AVE NIAGARA FALLS

41

LOAD QUANTITY	CUMULATIVE QUANTITY	DELIVERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
7.50	7.50	7.50	440572	4000 #57 AE/A 41	YD		

SUB TOTAL
TAX
TOTAL

96E CONCRETE FOR SDMH #2

CONCRETE DELIVERY TICKET

EMPIRE BUILDERS SUPPLY DIV. OF
BUFFALO, NEW YORK 14211-1790

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
2:52	3:04	3:16	3:26	:	:	:

WARNING

ET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN
RITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:
Avoid all contact with eyes.
In case of eye contact FLUSH thoroughly with water.
Avoid skin contact whenever possible and wash exposed skin promptly with water.
Wear rubber boots, gloves and appropriate eye protection.
If irritation persists, get medical attention promptly.
Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

_____ GAL X _____ X _____ TEST TAKEN: _____

IT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1A	3701	A2	11A	5.00	4000 PSI SIZE 67 OR 7 SH 1A	5"	01-Aug-96

TOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
345000	CERRONE INCORPORATED	96-F	

VERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
42ND. STREET &		UNKNOWN		15:15

RUCTIONS
FFALO AVE.

63

LOAD UANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
5.00	6.00	1.00	440067	4000 #67 OR 7A 63	YD		

TOTAL

Placed 3:40 to 4:10
concrete

LAFARGE BUILDERS SUPPLY DIV. OF
[illegible] BAILEY AVENUE
BUFFALO, NEW YORK 14211-1790

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
3:35	3:43	3:58	4:01	4:05	:	:

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

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3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
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5. If irritation persists, get medical attention promptly.
6. Keep children away.

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_____ GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
16	3761	54	114	1.00	4000 PSI SIZE 67 AE/ASH LO	3.0	05-Aug-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
3450000	CERTAINTEED/AMHERST	96-F	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
100ND. STREET & RIVER RD.		UNKNOWN		16:00

INSTRUCTIONS
LANDFILL

6.3

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1.00	3.00	2.00	440672	4000 #67 AE/T 6.3	YD		

SUB TOTAL
TAX
TOTAL

Placed 4:00 – 4:10

3.5 inch slump in field

EMPIRE BUILDERS SUPPLY DIV. OF
2525 BAILEY AVENUE
BUFFALO, NEW YORK 14211-1798

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	:	:	:	:	:

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

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_____ GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
16	3754	44	124	2.00	4000 PST SIZE 67 AE/ASH 15	3.0	05-Aug-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
345000	CERRONE ENCAPSULATED	96-F	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
LONG STREET & RIVER RD.		UNKNOWN		14:00

INSTRUCTIONS: LANDFILL

63

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
2.00	2.00	2.00	440672	4000 #67 AE/15 6.5	YD		

SUB TOTAL
TAX
TOTAL

placed 2:00 – 2:40 pm

add 4 gal water to batch at the site

CONCRETE PLACEMENT AND FIELD TESTING REPORT

OXYCHEM/OLIN
102nd STREET LANDFILL REMEDIATION
NIAGARA FALLS, NEW YORK

Client: Smith Environmental Technologies Corp. Report No.: DFS-40 Date: 8/7/96
Concrete Contractor: Cerrone Weather: clear; temp 85 to 90°F; wind light
Concrete Placement Location: Manhole #4 around concrete piers
Concrete Supplier: Empire Builders Supply Mix No.: 57
Cubic Yards Placed: 1 Time of Placement: 1200 to 1335 pm

Field Observations and Tests:

Truck No.	Cubic Yards	~~Time Batched~~ Time Left Plant	Time-On Site	Time of Placement	Water Added After Batching	Slump (inches)(1)	Air Content (%)(2)	Concrete Temp (°F)(3)	Test Cylinder Set No.(4)	No. of Cylinders
117	1	12:41	1250	1200 to 1335 pm	No	3.0 From Plant	—	—	5	3
						3.5 Field				

Concrete Tests: (1) Slump (ASTM C143); (2) Air Content (ASTM C173); (3) Concrete Temp (ASTM C1064); (4) Test Cylinder Fabrication (ASTM C31) * See attached copy of ticket.

Remarks:

GZA Technician GJR

GZA GeoEnvironmental of New York
Engineers and Scientists

EMPIRE BUILDERS SUPPLY DIV. OF
2255 BAILEY AVENUE
BUFFALO, NEW YORK 14211-1798

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	12:41	12:57	13:14	:	:	:

WARNING

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5. If irritation persists, get medical attention promptly.
6. Keep children away.

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
16	3820	A0	117	1.00	4000 PSI SIZE 57 AE/ASH LA	3.0	07-Aug-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
345000	CERRONE INC\ADDAND		

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
LOEND. STREET & RIVER RD.		UNKNOWN		13:00

INSTRUCTIONS

41

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1.00	1.00	1.00	440572	4000 #57 AE/A 41	YD		

SUBTOTAL

TAX

TOTAL

CONCRETE PLACEMENT AND FIELD TESTING REPORT

OXYCHEM/OLIN
102nd STREET LANDFILL REMEDIATION
NIAGARA FALLS, NEW YORK

Client: Smith Environmental Technologies Corp. Report No.: DFS - 44 Date: 8/13/96
Concrete Contractor: Cerrone Weather: clear; temp: 73 - 75°
Concrete Placement Location: Manhole 5 around east side pipe; Manhole 4 around north side pipe; Manhole 1 east wall fill and part of invert at manhole 6.
Concrete Supplier: Empire Ready Mix Supply Mix No.: 4000 lb #57 AE/A 41
Cubic Yards Placed: 2.5 Time of Placement: 10^{20} to 11^{30}

Field Observations and Tests:

Truck No.	Cubic Yards	Time Batched	Time-On Site	Time of Placement	Water Added After Batching	Slump (inches)(1)	Air Content (%)(2)	Concrete Temp (°F)(3)	Test Cylinder Set No.(4)	No. of Cylinders
117	2.5	9^{35} am	9^{51}-11^{30}	10^{20} - 11^{30}	none	3.0	—	—		3
						2.5 measured in field				

Concrete Tests: (1) Slump (ASTM C143); (2) Air Content (ASTM C173); (3) Concrete Temp (ASTM C1064); (4) Test Cylinder Fabrication (ASTM C31)

Remarks: * See attached ticket.

GZA Technician [illegible]

GZA GeoEnvironmental of New York

E[illegible]RE BUILDERS SUPPLY DIV. OF
[illegible] BAILEY AVENUE
BUFFALO, NEW YORK 14211-1798

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	9:25	9:51	10:01		:	:

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

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3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free uploading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
16	[illegible]3922	66	117	2.50	4000 PSI SIZE 57 AE/ASH LA	3.0	13-Aug-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
345000	CERRONE INC\ARMAND)		

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
102ND. STREET & RIVER RD.		UNKNOWN		10:00

INSTRUCTIONS: LANDFILL. #1

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
2.50	2.50	2.50	440572	4000 #57 AE/A 41	YD		

SUB TOTAL
TAX
TOTAL

10^{20} - 10^{40} Manhole 5 around east side pipes

10^{40} - 10^{50} manhole 4 east south side pipes

10^{55} - 11^{10} manhole 1 east wall #19

11^{20} - 11^{30} [illegible]

2.5 inch slump

CONCRETE PLACEMENT AND FIELD TESTING REPORT

3 of 5

OXYCHEM/OLIN
102nd STREET LANDFILL REMEDIATION
NIAGARA FALLS, NEW YORK

Client: Smith Environmental Technologies Corp. Report No.: DFS - 44 Date: 8/13/96
Concrete Contractor: Cerrone Weather: clear ; temp 70-75°F
Concrete Placement Location: Manhole 6 and manhole 7 inverts

Concrete Supplier: Empire Builders Supply Mix No.: 4000 lb #57 AE/A 41
Cubic Yards Placed: approx 2.5 Time of Placement: 3³⁰ - 4⁰⁰ pm

Field Observations and Tests:

Truck No.	Cubic Yards	Time Batched	Time-On Site	Time of Placement	Water Added After Batching	Slump (inches)(1)	Air Content (%)(2)	Concrete Temp (°F)(3)	Test Cylinder Set No.(4)	No. of Cylinders
119	Appr 2.5	500 Ticket		3³⁰ - 4⁰⁰	none	3.0				
						No testing required. Lean concrete.				

Concrete Tests: (1) Slump (ASTM C143); (2) Air Content (ASTM C173); (3) Concrete Temp (ASTM C1064); (4) Test Cylinder Fabrication (ASTM C31)

Remarks:

GZA Technician CJH

GZA GeoEnvironmental of New York

59 [illegible] AVENUE
BUFFALO, NEW YORK 14211-1798

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
15:01	:	:	:	:	:	:

WARNING

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1. Avoid all contact with eyes.
2. In case of eye contact FLUSH thoroughly with water.
3. Avoid skin contact whenever possible and wash exposed skin promptly with water.
4. Wear rubber boots, gloves and appropriate eye protection.
5. If irritation persists, get medical attention promptly.
6. Keep children away.

CONDITIONS: Free unloading time will be allowed at a rate of 5 min. per yd. with a minimum of 15 min. per load. Additional time will be charged at the rate of $1.00 per min ($60.00 per hr.). Any water added to the mix as furnished, shall be only on the request of and at the purchaser's risk. Acceptance by signature or payment of this order by the owner, contractor or his representative relieves this Company or its agents of any responsibility for any damage caused by moving vehicle beyond limits of improved road or right of way. This also includes carrying of mud, dirt, etc. onto pavement by vehicles ordered off said property.

GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
16	3942	66	119	4.50	4000 PSI STR 57 AFGHSH 1M	3.0	13-Aug-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
345000	CERRONE INCORPORATED		

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
102ND. STREET & RIVER RD.		UNKNOWN		15:14

INSTRUCTIONS
LANDFILL

41

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
4.50	7.00	2.50	440572	4000 #57 AE/C 41	YD		

SUB TOTAL
TAX
TOTAL

Placed 3.50 - 4.00
at invert of MH 8 a.17

[illegible] STREET LANDFILL REMEDIATION

[illegible]

Client: Smith Environmental Technologies Corp. Weather: clear [illegible]

Concrete Contractor: [illegible]

Concrete Placement Location: Inverts at MH-8 and MH-7, top of cast pipe at MH-3 (around [illegible])

Mix No.: 3000 psi Size 57 AE/ASH LA

Concrete Supplier: Empire Building Supply Time of Placement: 10:15 to 11:20 according to (Flour)

Cubic Yards Placed: 3

Field Observations and Tests:

Truck No.	Cubic Yards	~~Time Batched~~ Leave Plant	Time-On Site	Time of Placement	Water Added After Batching	Slump (inches)(1)	Air Content (%)(2)	Concrete Temp (°F)(3)	Test Cylinder Set No.(4)	No. of Cylinders
117	3	9:50	10:00 – 11:20	10:15 – 11:20	No	—	— Not required (Lean concrete)	—	—	—

Concrete Tests: (1) Slump (ASTM C143); (2) Air Content (ASTM C173); (3) Concrete Temp (ASTM C1064); (4) Test Cylinder Fabrication (ASTM C31)

Remarks: * See attached Ticket. GZA did not observe the placement of this concrete.

GZA Technician: G. Klawinski

GZA GeoEnvironmental of New York

2320 BAILEY AVENUE
BUFFALO, NEW YORK 14211-1798

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	9:50	10:02	10:05	:	:	:

WARNING

WET CONCRETE CAN CAUSE INJURY TO THE EYES AND SKIN IRRITATION WITH POSSIBLE BURNS. TAKE THESE PRECAUTIONS:

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_____ GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
16	4056	48	117	3.00	4000 1ST STZE 57 AE/ASH LO	3.0	19-Aug-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.	
345000	CERRONE INC\ARMAND			

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
102ND. STREET & RIVER RD.		UNKNOWN		10:00

INSTRUCTIONS	
LANDFIL	41

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
3.00	3.00	3.00	440572	4000. #57 AE/A 41	YD		

SUB TOTAL
TAX
TOTAL

11:20 load 5.

- Inverts on MH-8 + MH-9
- East Pipe @ MH-5 (Top of Pipe)
  - small arrow

CONCRETE PLACEMENT AND FIELD TESTING REPORT

OXYCHEM/OLIN
102nd STREET LANDFILL REMEDIATION
NIAGARA FALLS, NEW YORK

6/6

Client: Smith Environmental Technologies Corp. Report No.: DFS-67 Date: 9/10/96
Concrete Contractor: CERCONE Weather: 70° F SUNNY, WINDY
Concrete Placement Location: HEADWALL, SOUTH SIDE FORM SIDES
Concrete Supplier: EMPIRE Mix No.: 57 AE/A 4B
Cubic Yards Placed: 1.5 Time of Placement: 1:15 ~ 1:30

Field Observations and Tests:

SPEC < 4" | SPEC 4 ± 1 | SPEC. 7 DAYS 70% 28 DAY 28 28 " ≥ 4,000 PSI

Truck No.	Cubic Yards	Time Batched (LOAD TIME)	Time-On Site	Time of Placement	Water Added After Batching	Slump (inches)(1)	Air Content (%)(2)	Concrete Temp (°F)(3)	Test Cylinder Set No.(4)	No. of Cylinders
133	1.5	12:34	1:10	1:15pm	—	1 3/4	4.1	72	8	6

Concrete Tests: (1) Slump (ASTM C143); (2) Air Content (ASTM C173); (3) Concrete Temp (ASTM C1064); (4) Test Cylinder Fabrication (ASTM C31)

Remarks: * See attached copy of ticket.

GZA Technician Tom Snider

GZA GeoEnvironmental of New York
Engineers and Scientists

2557 BUTTE AVENUE
BUFFALO, NEW YORK 14211-1290

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
12:30	12:41	12:42	13:16	:	:	:

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GAL X _____ X 4K 4000 TEST TAKEN: YES

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
16	4618	56	133	1.50	4000 PSI STR 57 AE/ASH 10	3.0	10-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
345000	CERVONE THOMMAND		

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
LOPEZ & RIVER RD.		UNKNOWN		13:00

INSTRUCTIONS 40

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1.50	1.50	1.50	440572	4000 #57 AE/A 40	YD		

SUB TOTAL
TAX
TOTAL 112

Travel Time
Office Time
Total Time

See daily account for summary

Tom Seider
Gary Thomas

PREPARED BY

INSPECTOR COPY 2

CONCRETE PLACEMENT AND FIELD TESTING REPORT

OXYCHEM/OLIN
102nd STREET LANDFILL REMEDIATION
NIAGARA FALLS, NEW YORK

6 of 6

Client: Smith Environmental Technologies Corp. Report No.: DFS-68 Date: 9/19/96
Concrete Contractor: Smith Environmental Weather: Sun field report
Concrete Placement Location: North end plug in old storm sewer.

Concrete Supplier: American Concrete Mix No.: 4 f'c 4000 psi No 4471.
Cubic Yards Placed: 6.5 Time of Placement: 1[illegible]

Field Observations and Tests:

Amb Air Temp 75°F

Truck No.	Cubic Yards	Time Batched	Time-On Site	Time of Placement	Water Added After Batching	Slump (inches)(1)	Air Content (%)(2)	Concrete Temp (°F)(3)	Test Cylinder Set No.(4)	No. of Cylinders
217	6.5	13:29	1[illegible]	1[illegible]	Yes - 10 gal	4+	4.5	70	9	6

Concrete Tests: (1) Slump (ASTM C143); (2) Air Content (ASTM C173); (3) Concrete Temp (ASTM C1064); (4) Test Cylinder Fabrication (ASTM C31)

Remarks: * See attached sample slip.

GZA Technician [illegible]

GZA GeoEnvironmental of New York
Engineers and Scientists

LOAD TIME	LEAVE PLANT	ARRIVE JOB	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	1:10	:	:	:	:

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None GAL X ______ X ______ TEST TAKEN: ______

PLANT	TICKET NO.	ORDER NO	TRUCK NO	LOAD SIZE	MIX	SLUMP	DATE
[illegible]	10027675	20	[illegible]	6.50	3000 [illegible] MIX 4	3.0	19-Sep-96

CUSTOMER NO.: 1515A00
SOLD TO: [illegible] ENVIRONMENTAL [illegible] CORP
DELIVERY ADDRESS: [illegible] BUFFALO AVE - NIA FALLS
MAP PAGE:
P.O. NO:
PROJECT NO.:
USE: [illegible]
DRIVER: [illegible]
TIME DUE: 13:00

INSTRUCTIONS: LOCKPORT RD L/T MILMORE RD R/T [illegible] FALLS BLVD L/T WILLIAMS RD R/T BUFFALO AVE

4

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
6.50	6.50	6.50	930572	3000 MIX 4	YD		

BATCH NO. [illegible] LOAD SIZE 6.50 FORMULA CODE 4
TRUCK NO [illegible] [illegible] 6.50
[illegible]
AGG 02 [illegible] AGG 04 17100 LB
AGG 01 [illegible]
CEM 01 [illegible] CEM 02 3370 LB
WATER [illegible]
AXA [illegible] 100 OZ

SUB TOTAL
TIME 12:25:32
TOTAL 09/19/96

TIME [illegible]
END [illegible]
[illegible] 00 OZ [illegible] 00 LB CEM 00 LB WAT 00 GL
[illegible] 00 OZ [illegible] 00 OZ [illegible] 00 OZ AXD 00 OZ
[illegible] 00 OZ [illegible] 00 OZ

Amb Temp 45°F Placed 1:20 - 1:50 Slump 4"
Temp 70°F Air 4.5 6 cyl

CONCRETE DELIVERY TICKET

CUSTOMER COPY

Office Time ______
Total Time ______

GZA

Gary Klawinski
PREPARED BY

1

CONCRETE PLACEMENT AND FIELD TESTING REPORT

OXYCHEM/OLIN
102nd STREET LANDFILL REMEDIATION
NIAGARA FALLS, NEW YORK

Client: Smith Environmental Technologies Corp. Report No.: DFS-69 Date: 9/20/97
Concrete Contractor: Corrone Weather: See attached report (sheet 1)
Concrete Placement Location: Eastern West wing walls at south end of new storm sewer
Concrete Supplier: Empire Builders Supply Mix No.: #57 AE/40
Cubic Yards Placed: 1.5 Time of Placement: 1^10 to 1^20 pm

Field Observations and Tests:

Truck No.	Cubic Yards	Time Batched	Time-On Site	Time of Placement	Water Added After Batching	Slump (inches)[1]	Air Content (%)[2]	Concrete Temp (°F)[3] Amb air temp 80°F	Test Cylinder Set No.[4]	No. of Cylinders
12	1.5	* ticket	1^10	1^10 to 1^20 pm	No	2	4.5	70°F	10	6

Concrete Tests: (1) Slump (ASTM C143); (2) Air Content (ASTM C173); (3) Concrete Temp (ASTM C1064); (4) Test Cylinder Fabrication (ASTM C31)

Remarks: * See attached copy of ticket.

GZA Technician G. Klawinski

GZA GeoEnvironmental of New York
Engineers and Scientists

[illegible] BUFFALO AVENUE
BUFFALO, NEW YORK 14211-1798

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
[illegible]	:	:	:	:	:	:

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO	TRUCK NO	LOAD SIZE	MIX	SLUMP	DATE
5	5008243	[illegible]	[illegible]	1.50	[illegible]	3.0	20-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
[illegible]	CURRENT INC-ON-DEMAND		

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
LOCKPORT & ROYER RD.		UNKNOWN		ASAP

INSTRUCTIONS: NIAGARA FALLS NEW YORK — 40

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1.50	1.50	3 1.50	[illegible]	[illegible]	YD		

SUBTOTAL
TAX
TOTAL

1) 5 ½
3 slumps 2) 5 ½
3) 7 ½ Add admixtures prior to placement

Load rejected by Scott (Plant), Material not placed.

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	:	:	:	:	:

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO	LOAD SIZE	MIX	SLUMP	DATE

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE

INSTRUCTIONS

NIAGARA FALLS NEW YORK

40

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1.50	1.50	1.50	[illegible]	[illegible]	YD		

SUB TOTAL
TAX
TOTAL

Slump 2"
Air 4.5 %
6 cyl
110 to 120

Storm sewer south end wing walls

CONCRETE PLACEMENT AND FIELD TESTING REPORT

OXYCHEM/OLIN
102nd STREET LANDFILL REMEDIATION
NIAGARA FALLS, NEW YORK

Client: Smith Environmental Technologies Corp. Report No.: DFS-69 Date: 9/10/96
Concrete Contractor: Smith Environmental Weather: See field report
Concrete Placement Location: Storm Sewer Line Plug at Smith Pad.

Concrete Supplier: American Mix No.: 4
Cubic Yards Placed: 8.5 Time of Placement: 3:15 - 3:45 pm

Field Observations and Tests:

Truck No.	Cubic Yards	Time Batched	Time-On Site	Time of Placement	Water Added After Batching	Slump (inches)(1)	Air Content (%)(2)	Concrete Temp (°F)(3) Amb Temp 76°F	Test Cylinder Set No.(4)	No. of Cylinders
207	8.5	2:15 pm	3:10 pm	3:15 - 3:45 pm	No	2	5	78°F	11	6

Concrete Tests: (1) Slump (ASTM C143); (2) Air Content (ASTM C173); (3) Concrete Temp (ASTM C1064); (4) Test Cylinder Fabrication (ASTM C31)

Remarks: * See attached supplier ticket.

GZA Technician G. Klaviniki

GZA GeoEnvironmental of New York
Engineers and Scientists

LOCKPORT, NEW YORK 14094

FAX: 43[illegible]

LOAD TIME	LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	LEAVE JOB SITE	ARRIVE PLANT
:	:	:	:	:	:	:

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GAL X _____ X _____ TEST TAKEN: _____

PLANT	TICKET NO.	ORDER NO.	TRUCK NO.	LOAD SIZE	MIX	SLUMP	DATE
1	1007773	13	207	4.50	3000 PSI [illegible] MIX 4	3.0	20-Sep-96

CUSTOMER NO.	SOLD TO	P.O. NO.	PROJECT NO.
1915A00	SMITH ENVIRONMENTAL TECH. CORP.	RAY	

DELIVERY ADDRESS	MAP PAGE	USE	DRIVER	TIME DUE
9029 BUFFALO AVE - NIAGARA FALLS		MISC.	DAN R.	15:00

INSTRUCTIONS

LOCKPORT RD L/T WALMORT RD R/T NIAGARA FALLS BLVD L WILLIAMS RD R/T BUFFALO AVE

4

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT OF MEASURE	UNIT PRICE	AMOUNT
4.50	4.50	4.50	230572	3000 MIX 4	YD		

Slump 2
Air 5%
3[illegible] - 3[illegible] pm

SUB TOTAL

TIME 14:14:30
DATE 09/20/96
TOTAL

BATCH NO. [illegible] LOAD SIZE 4.50 ORDERED 4.50
TRUCK NO. 207 DELIVERED 4
WAT TEMP 2.0 LOAD 4
AGG 1 [illegible] LB MIX 4.0 AGG 1 22,500 LB
AGG 2 [illegible] LB CEM 400 LB
CEM [illegible] LB
WATER 171 GL
ADD [illegible] ADD 1.50 OZ

CEM [illegible] AGG 1 [illegible] LB CEM [illegible] WAT [illegible] GL
AGG [illegible] AGG 2 [illegible] ADD [illegible] OZ
ADD [illegible] ADD [illegible] OZ

CONCRETE DELIVERY TICKET

APPENDIX E

FIELD CHANGE APPROVALS

FIELD CHANGE APPROVAL (FCA)

Project Name:	Project Number:	AWA Number:	Date:
102ND ST LANDFILL		31	11-5-96

Identification of Area and Item:

BID ITEM 1H - RETAINING WALL

Description of Change:

INSTALL DRAIN LINE & DRAIN INTO EXISTING (PLUS ONE NEW) CATCH BASINS / MANHOLES ALONG BUFF AVE. THIS IS TO ELIMINATE FROST ACTION ON RETAINING WALL WATER WOULD BE TRAPPED WITHOUT DRAINAGE. THIS IS APPROVED BY CITY OF NIAG. FALLS

Authorization/Acknowledgment:

Owner's Field Construction Manager: [signature] Date: 11/7/96

Contractor's Site Representative: [signature] Date: 11/7/96

Owner's Project Managers/Environmental: [signature] Date: 11/7/96

Owner's Construction QualityAssurance: Scott Lawrence for Cliff Mans PE Date: 11/7/96

NYSDEC Comments:

OK

Approved: [signature]

NYSDEC Construction Inspection Date: 11/25/96

Distribution:

NYSDEC: T. Robinson Fluor Daniel: C. Mars, S. Lawrence Olin: J.T. Serfass, L.M. Miller, R. Taylor OCC: L. Nigro, G. Catlin, B. Hout, J. Thornton, File

c:\excel\forms\fca102nd.xls

OxyChem®

October 15, 1996

Mr. Kevin O'Brien
City Engineer
Engineering Department
City Hall
Niagara Falls, New York 14302

Dear Mr. O'Brien,

This letter is in regards to our conversation on Thursday regarding the 102nd Street Landfill project being undertaken by Occidental Chemical and Olin Corporation. At that time we discussed the crib wall structure which is being installed along the south side of Buffalo Avenue. I mentioned that the wall is installed 1' below grade but the original design did not indicate a need for underdrain to remove water from this area.

We are proposing to install an underdrain system composed of AKWADRAIN prefabricated soil strip drain. Some information on this product is attached. It is a plastic geogrid type of material with filter fabric around the exterior. We would install this material on the north side of the wall at the same level as the bottom of the wall structure. This would be approximately 13' south of the south edge of Buffalo Avenue. The area around the AKWADRAIN would be filled with 1a stone. The drain would be fitted with tees and end connectors with schedule 80 PVC pipe to connect to the existing storm sewer manholes and catchbasins along Buffalo Avenue. I have attached some sketches indicating the plan location and elevation of the drain system.

I have also included an overall view of the location of the crib wall. We would like to connect the new system to SDMH-3, SDMH-4, CB-1, CB-2, CB-3, CB-4, CB-5, and CB-6.

If you need additional information please call me at 773-8304.

Sincerely yours,

J C Thornton

James C. Thornton P.E.
Civil Engineer

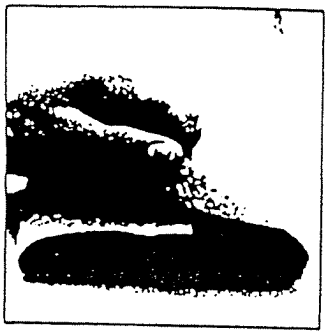
cc (with attachments)
J. Serfass - Olin Corporation
G. Catlin
R. Hout ✓
T. Robinson - NYSDEC

UNDERD.KOB
G:\...\102ND

AKWADRAIN™

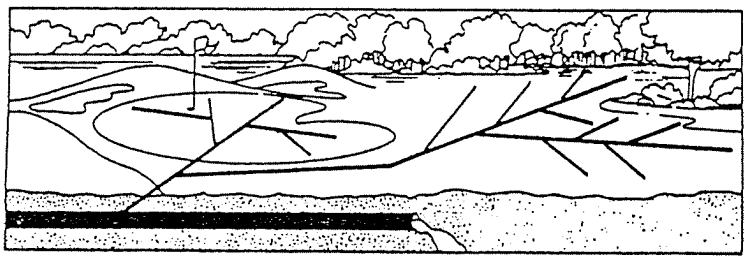
Prefabricated soil strip drain

6"

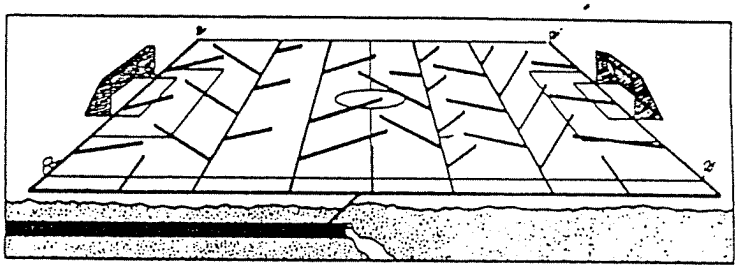


AKWADRAIN strip drain is a prefabricated, high flow drainage system that offers better drawdown of water than pipe while costing around 60 % less to install. ***AKWADRAIN*** strip drain consists of a formed polymeric core surrounded by a geotextile filter fabric. The fabric allows water to pass into the core while restraining soil particles which might clog the core. The core allows water to flow to designated drain exits. ***AKWADRAIN*** strip drain is 1" thick by 4" wide and is available in 100' long rolls.

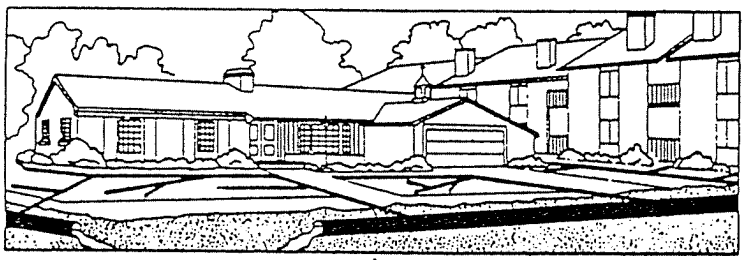
With a crush strength of 4,000 or 8'000 psf, ***AKWADRAIN'S*** core easily withstands the pressures of backfilling and compaction during installation with no loss of flow area. And the multichannel structure of the formed polyethylene core provides significantly increased water flow. The tough non-woven, needle-punched polypropylene filter fabric covering prevents core clogging while allowing water entry through every inch of its surface.



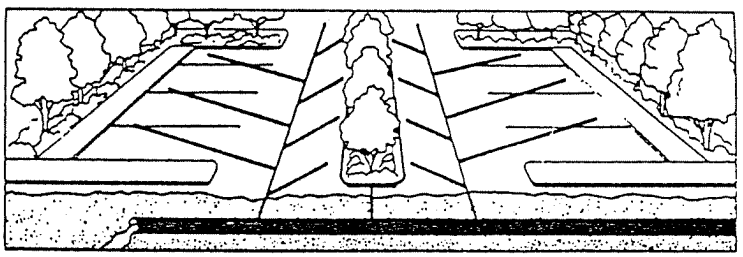
r golf course tees, fairways and greens



For other athletic fields or recreational areas

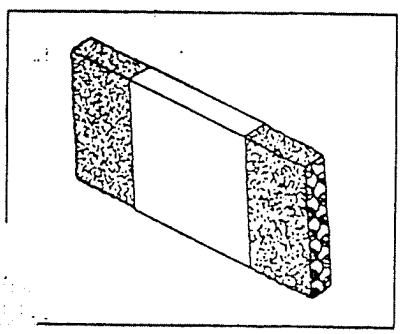


For residential and commercial properties

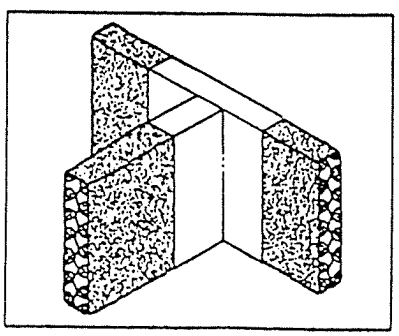


For parking areas and planters

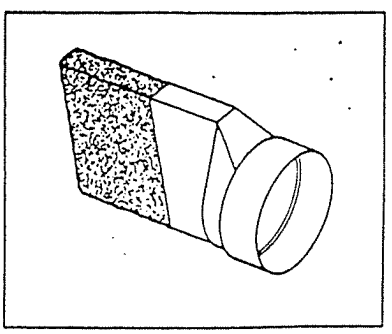
Standard *AKWADRAIN*™ strip drain fittings



Splice to connect sections of drain



Tee to make 90° connections

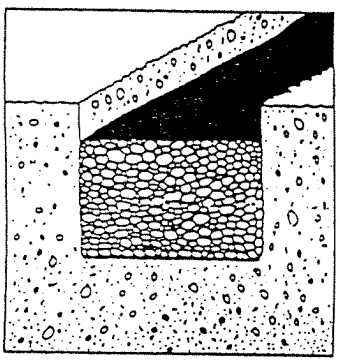


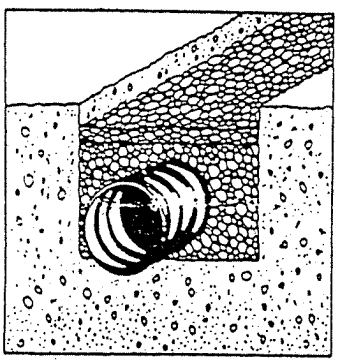
End connector to attach strip drain to 4" PVC or corrugated polyethylene sewer pipe

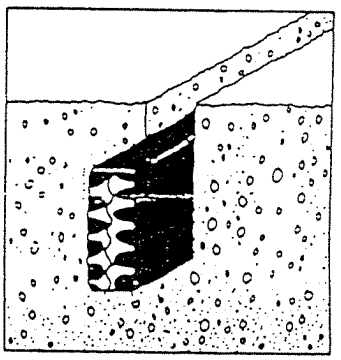
Typical *AKWADRAIN*™ strip drain product properties

Fabric Properties	
Weight, oz/sq yd	4.0
Grab strength, lbs	135
Puncture strength, psi	70
Trapezoidal tear, lbs	60
Burst strength, psi	240
Elongation, %	80
EOS	70
Permeability, cm/sec	0.20
Flow rate, gpm/sq ft	120
Permittivity, sec-1	1.96
Fungus resistance	No Growth

Core Properties	
Thickness, in	1
Compressive strength, lbs/sq ft	4,000/8,000
Flow capacity, gpm/sq ft of width	30
Specific gravity	0.951
Water absorption, % at 24 hours	.01
Tensile strength, psi at yield	3800
Fungus resistance	No Growth



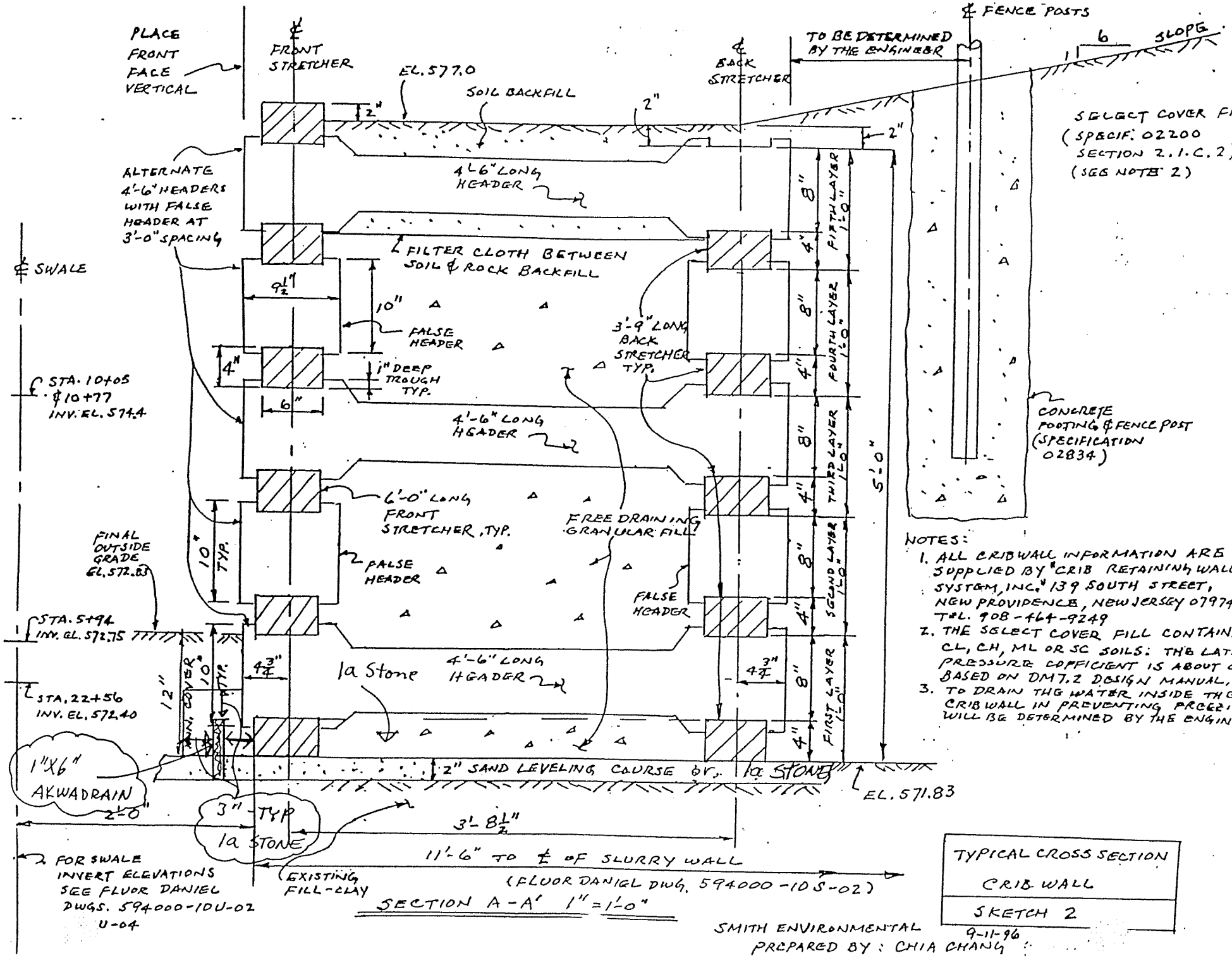




	French Drain	Pipe Drain	Strip Drain
Pipe	None required	4" minimum	Not required
Fabric	Yes	Yes	Already on core
Stone or Sand	Yes	Yes	Not required
Backhoe	Yes	Yes	Not required
Trencher	No	No	2" Trencher
Dump Truck	Yes	Yes	Not required
Pickup	Yes	Yes	Yes
Laborers	3 minimum	3 minimum	1
Trench Width	12" minimum	12" minimum	2"
BOTTOM LINE	——	——	PROFIT

AMERICAN WICK DRAIN CORPORATION
316 Warehouse Drive
Matthews, NC 28105
Phones: (800) 438-9281 (704) 821-7681
Fax (704) 821-6441
Telex 572385

SD-0689-10



SECTION A-A' 1" = 1'-0"

NOTES:

1. ALL CRIBWALL INFORMATION ARE SUPPLIED BY "CRIB RETAINING WALL SYSTEM, INC." 139 SOUTH STREET, NEW PROVIDENCE, NEW JERSEY 07974 TEL. 908-464-9249
2. THE SELECT COVER FILL CONTAINS CL, CH, ML OR SC SOILS: THE LATE PRESSURE COFFICIENT IS ABOUT 0 BASED ON DM7.2 DESIGN MANUAL.
3. TO DRAIN THE WATER INSIDE THE CRIB WALL IN PREVENTING PREGIN WILL BE DETERMINED BY THE ENGIN

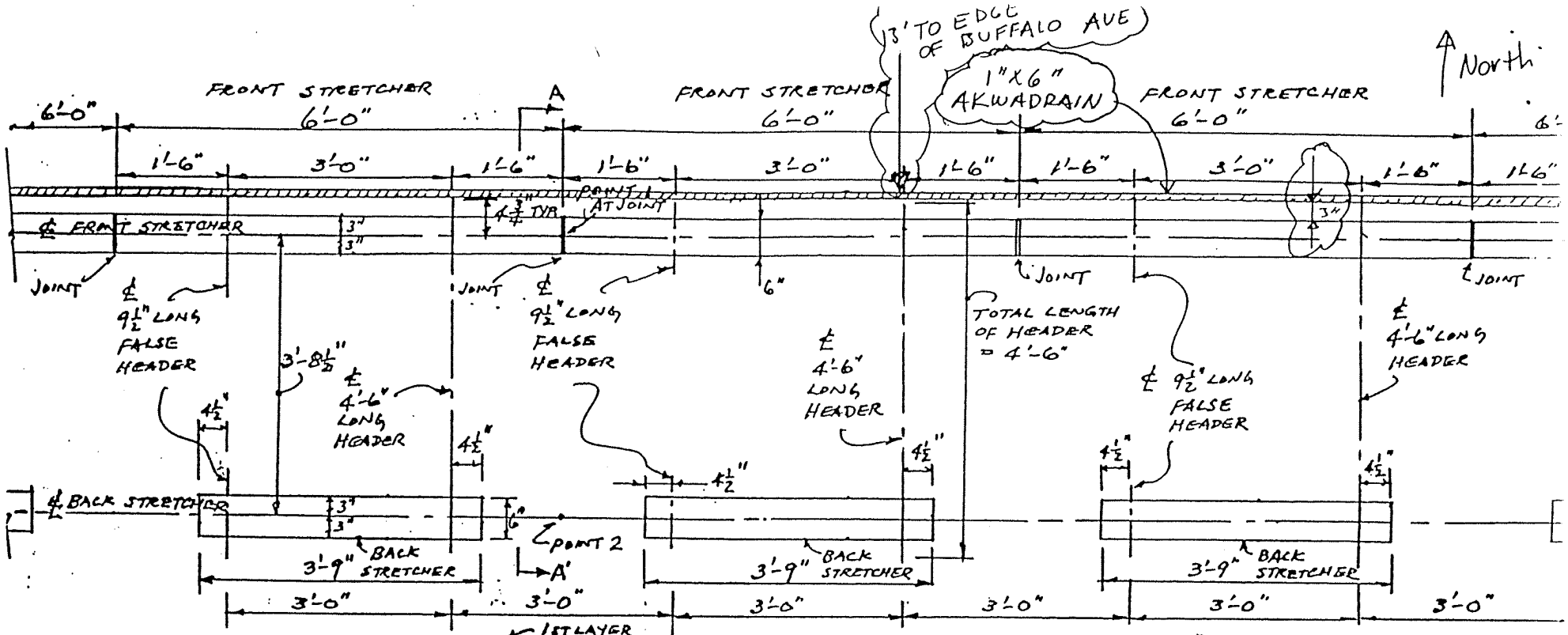
TYPICAL CROSS SECTION
CRIB WALL
SKETCH 2

9-11-96

SMITH ENVIRONMENTAL

PREPARED BY: CHIA CHANG

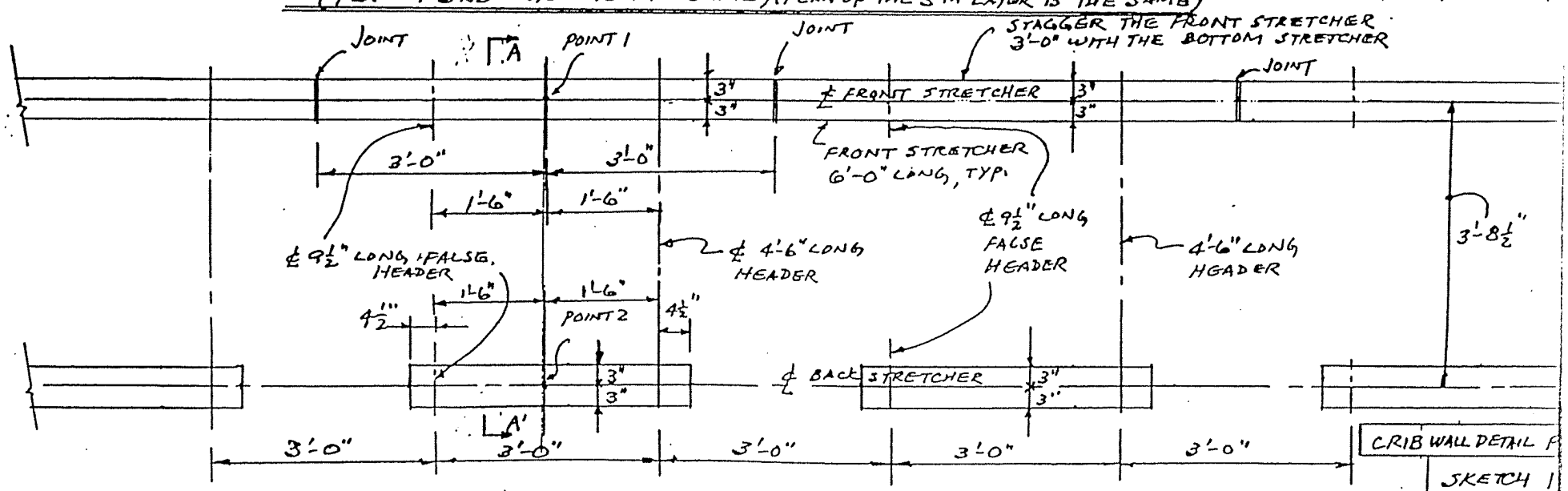
CHECKED BY: PETE PORTER



PLAN OF BOTTOM LAYER STRETCHERS AND HEADERS ABOVE $\frac{1}{2}$"=1'-0"

(PLAN OF 3RD LAYER IS THE SAME) (PLAN OF THE 5TH LAYER IS THE SAME)

NOTE: ALL STRET
ARE 4" THICK.



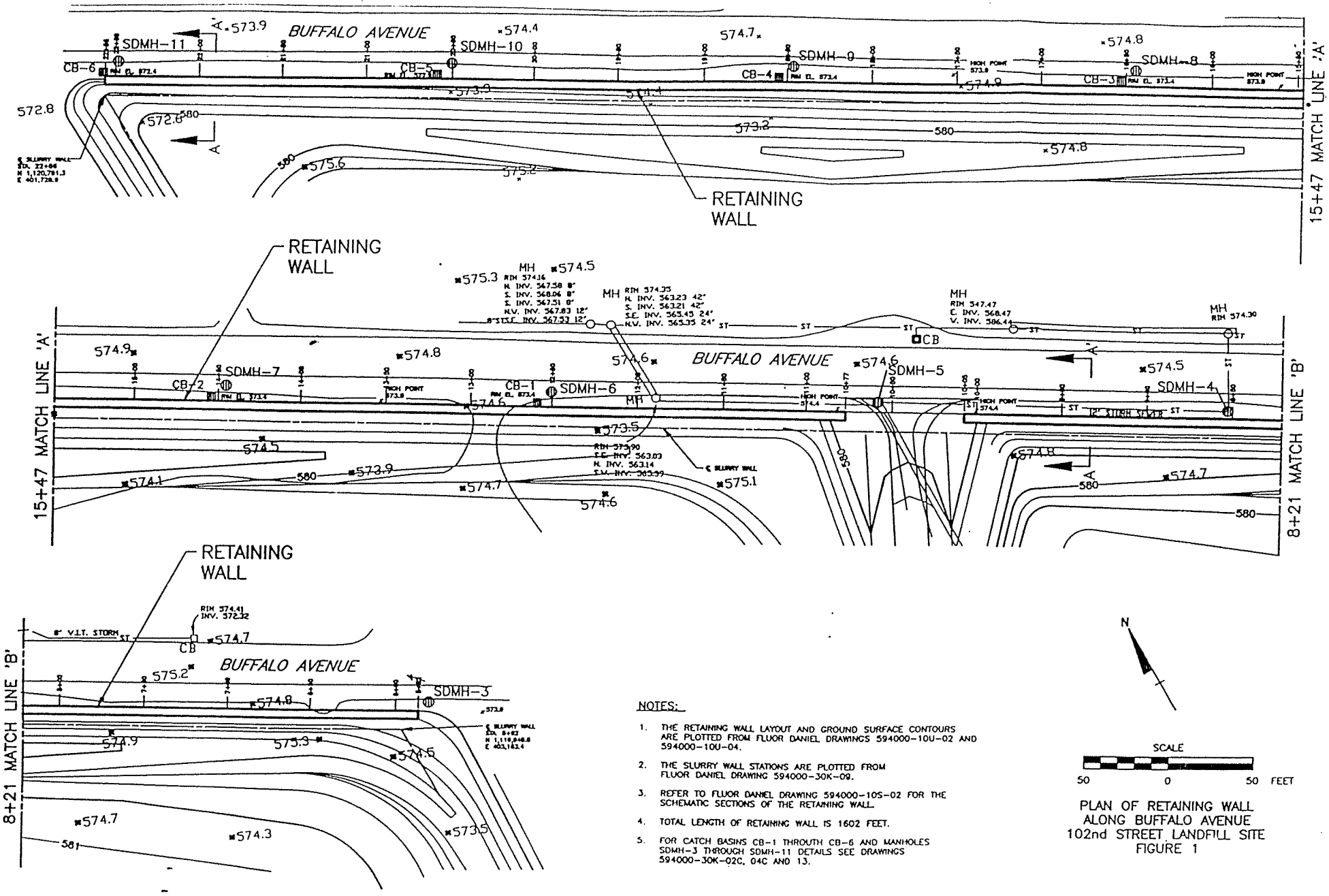
PLAN OF SECOND LAYER STRETCHERS AND HEADERS ABOVE $\frac{1}{2}$"=1'-0"

(PLAN OF THE 4TH LAYER IS THE SAME)

CRIB WALL DETAIL F

SKETCH 1

SMIT... NVIRONMENTA...
PRO... D BY: CHIACHAN...
CHECKED BY: PETE PORTE...



NOTES:

1. THE RETAINING WALL LAYOUT AND GROUND SURFACE CONTOURS ARE PLOTTED FROM FLUOR DANIEL DRAWINGS 594000-10U-02 AND 594000-10U-04.
2. THE SLURRY WALL STATIONS ARE PLOTTED FROM FLUOR DANIEL DRAWING 594000-30K-09.
3. REFER TO FLUOR DANIEL DRAWING 594000-10S-02 FOR THE SCHEMATIC SECTIONS OF THE RETAINING WALL.
4. TOTAL LENGTH OF RETAINING WALL IS 1602 FEET.
5. FOR CATCH BASINS CB-1 THROUTH CB-6 AND MANHOLES SDMH-3 THROUGH SDMH-11 DETAILS SEE DRAWINGS 594000-30K-02C, 04C AND 13.

N

SCALE

50 0 50 FEET

PLAN OF RETAINING WALL
ALONG BUFFALO AVENUE
102nd STREET LANDFILL SITE
FIGURE 1

FIELD CHANGE APPROVAL (FCA)

Project Name:	Project Number:	AWA Number:	Date:
102nd Street, LANDFILL			7-23-97

Identification of Area and Item:

Center Access Road at Buffalo Avenue

Description of Change:

Install 50' long subsurface collection trench and catch BASIN to connect with Storm Drain Manhole #5. Collection Trench to be 1' wide and contain a 4" PVC perforated Drain P.pe to be connected to catch Basin and MH-5. See attached Drawings.

Authorization/Acknowledgment:

Owner's Field Construction Manager: _____ Date: 7/23/97

Contractor's Site Representative: _____ Date: 7/24/97

Owner's Project Managers/Environmental: _____ Date: 7-23-97

Owner's Construction QualityAssurance: Scott Lawrence Date: 7-23-97

NYSDEC Comments:

Approved: _____ per Cliff & Nina City OK'd

NYSDEC Construction Inspection **Date:** 7/24/97

Distribution:

NYSDEC: T. Robinson Fluor Daniel: C. Mars, S. Lawrence Olin: ~~J.T. Serfass~~ J Burns, L.M. Miller, R. Taylor OCC: L. Nigro, G. Catlin, B. Hout, J. Thornton, File

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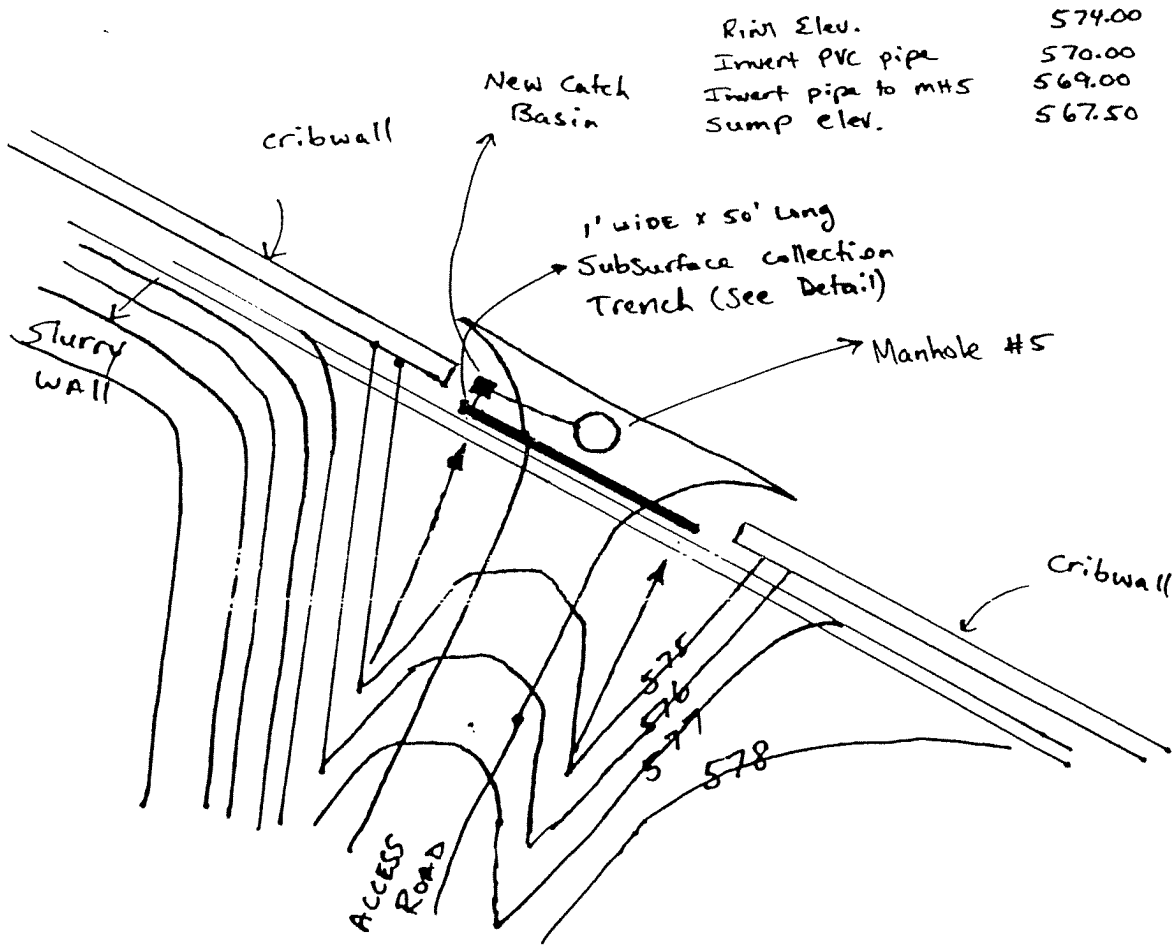


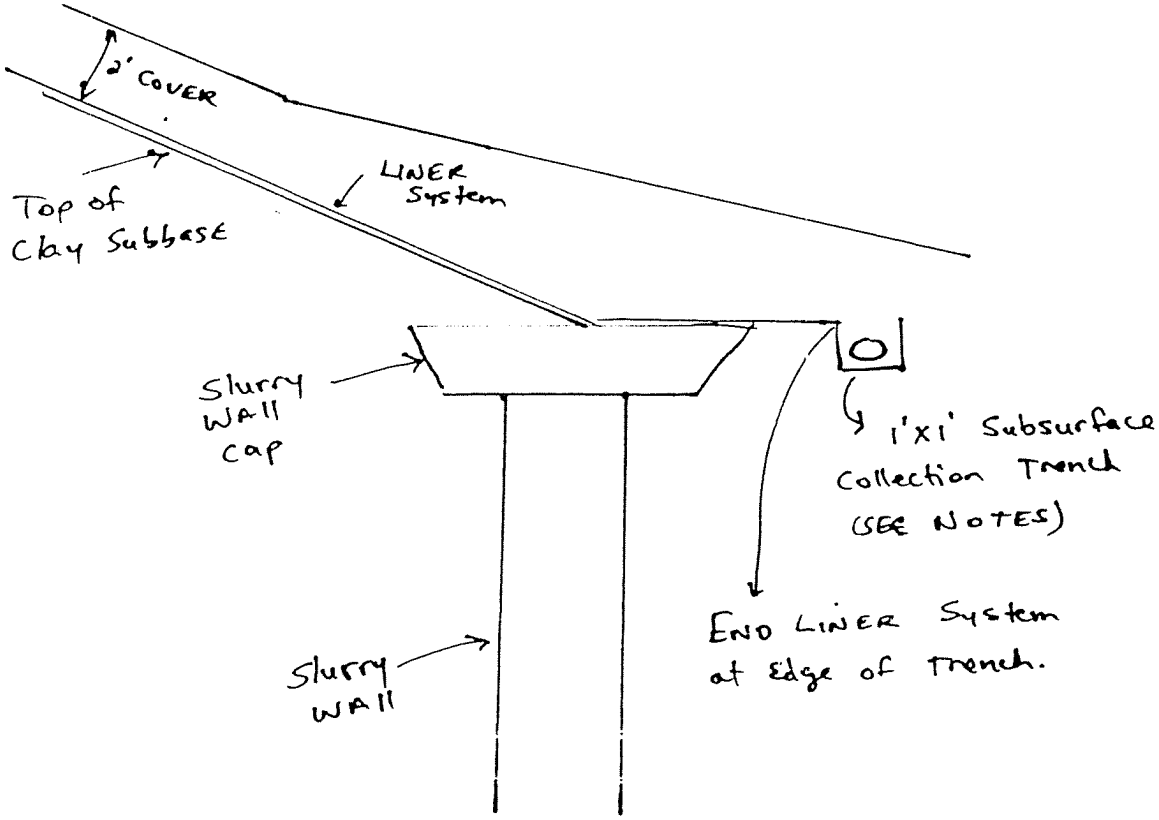
Manhole #5 Coordinates

1120187.99 N

402785.28 E

Rim Elev 573.48

Inv. Elev 563.66

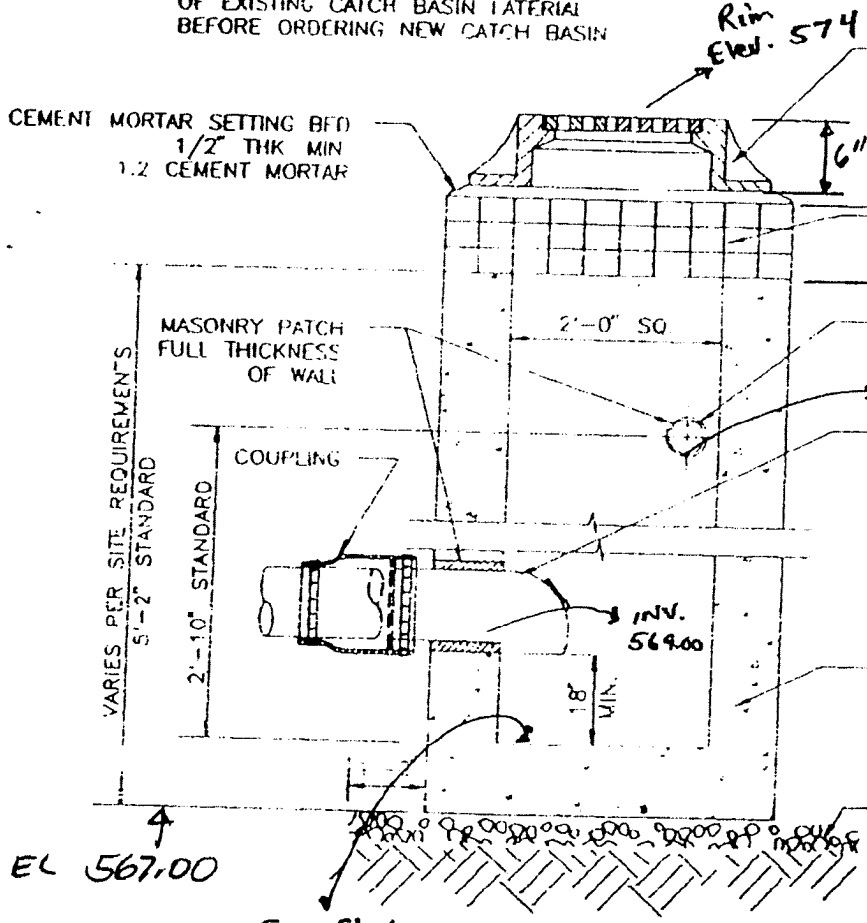


Notes:

1. Collection pipe shall be 4" PVC
2. USE 1A Stone AS BACKFILL
3. LINE Trench with a woven Geotextile.
4. Connect collection pipe to New Catch Basin. Connect catch basin to MH-5 with 8" Pipe.
5. Location of Trench will be determined in the FIELD by Oxychem/FLUOR DANIEL
6. Slope trench to the West.

REVISED PRECAST CATCH BASIN DETAIL

NOTE: CONTRACTOR SHALL VERIFY ELEVATION OF EXISTING CATCH BASIN MATERIAL BEFORE ORDERING NEW CATCH BASIN



CROSS SECTION

CATCH BASIN FRAME AND GRATE
NEENAH FOUNDRY COMPANY
CATALOG NO. R3433
MATERIAL – GREY IRON, ASTM A48-83
CLASS 35, H20 LOADING
OR EQUAL

RED FIRE CLAY BRICK
7 5/8" x 3 5/8" x 2 1/4" THK.
1 COURSE MIN. - 3 COURSES MAX.

8"ø KNOCK OUTS, 2 REQUIRED

CATCH BASIN TRAP
NEENAH FOUNDRY COMPANY
CATALOG NO. R3705-E
MATERIAL – GREY IRON, ASTM A48-83
CLASS 35, H20 LOADING
OR EQUAL
NOTE: TRAP IS NOT REQUIRED IF BASIN IS CONNECTED TO STORM SEWER

KISTNER PRECAST CONCRETE PRODUCTS INC.
PRECAST CONCRETE BASIN # CB-2454-S
CONCRETE MIN. 4000 PSI @ 28 DAYS
MIN. 6" THK WALLS
OR EQUAL

#1 STONE COMPACTED 12" MIN.

PAY LIMITS OF EXCAVATION AND SAW CUTTING – OUTSIDE DIMENSION OF CATCH BASIN PLUS 1'-0" ON ALL SIDES

PRECAST CONCRETE CATCH BASIN

CITY OF NIAGARA FALLS
ENGINEERING DEPARTMENT
745 MAIN STREET • NIAGARA FALLS, NEW YORK 302

SCALE N.A.

DATE 7/22/97

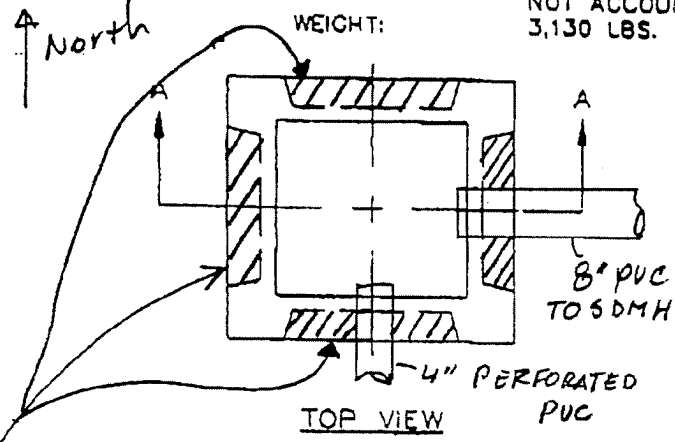
SHEET 1 of 1

PRECAST K
KISTNER CONCRETE PRODUCTS INC.
8713 READ ROAD
E. PEMBROKE, N.Y.
14056
(716) 894-2267

PRODUCT DESIGNATION	DWG. NO.
2' SQ. X 4.5' CATCH BASIN	CB-24 4

SPECIFICATIONS:

CONCRETE:	4,000 P.S.I. @ 28 DAYS.
ENTRAINED AIR:	5% - 9%.
STEEL:	A.S.T.M. A496-A615 GRADE 60-60 KSI.
DESIGN LOADING:	A.A.S.H.T.O. HS-20-44 WITH 30% IMPACT AND EQUIVALENT SOIL PRESSURE OF 130 (PSF). FLOATATION FORCES NOT ACCOUNTED FOR.
WEIGHT:	3,130 LBS.



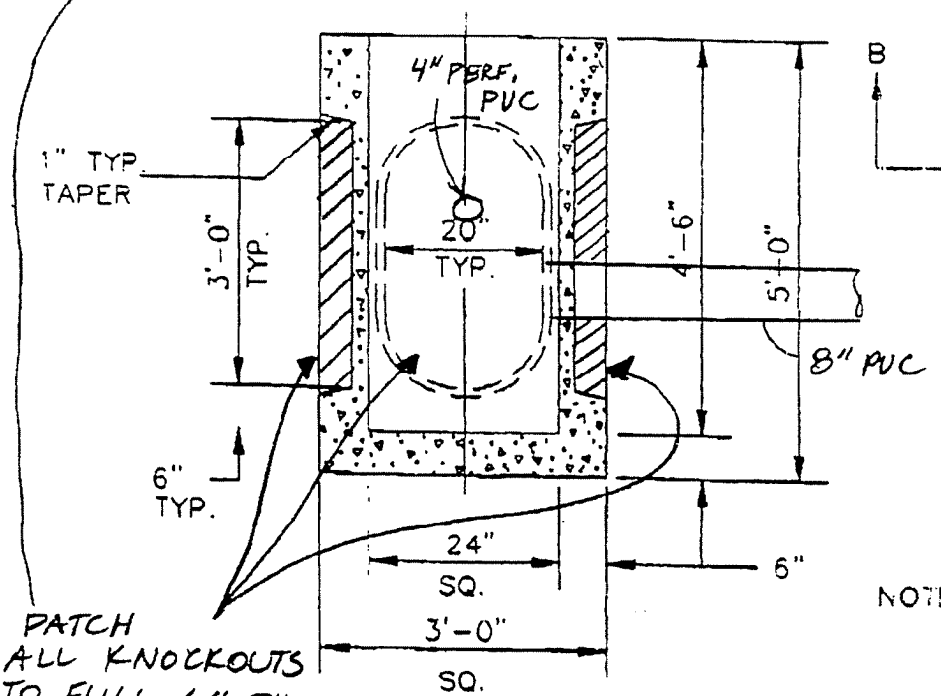
TOP VIEW

FRAME & GRATE:

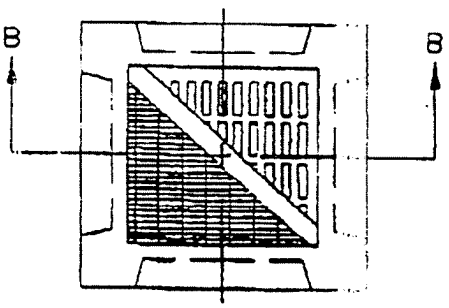
A: ☒ BY G.C.. – NEENAH R 4433 CODE: CB315B

B: ☐ NEENAH R4832B OR EQUAL. HS20-44, BICYCLE PROOF. CODE: CB316B

C: ☐ N.Y.S.D.O.T. RECTANGULAR 655-6R1 HS20-44, BICYCLE PROOF. CODE: CB316BR



SECTION A-A



GRATE DET.

SECTION B-B

NOTE:
WALL THICKNESS AT KNOCKOUT TO BE 2' MINIMUM.

FIELD CHANGE APPROVAL (FCA)

Project Name:	Project Number:	AWA Number:	Date:
102ND ST LANDFILL		33	11-5-96

Identification of Area and Item:

DRAINAGE SWALE ALONG BUFF AVE

Description of Change:

ELIMINATE TOPSOIL & SEEDING IN THE AREA BETWEEN EDGE OF ASPHALT SHOULDER & CRIB WALL & REPLACE IT WITH STONE

CHECKED WITH THE CITY OF NIAG. FALLS WHO IS IN AGREEMENT WITH THIS BECAUSE IT WILL HELP ELIMINATE A MAINTENANCE PROBLEM

Authorization/Acknowledgment:

Owner's Field Construction Manager: Lou Nigro Date: 11/7/96

Contractor's Site Representative: Pat Porto Date: 11/7/96

Owner's Project Managers/Environmental: JC Thornton JT. Serfass Date: 10/7/96

Owner's Construction QualityAssurance: Scott Lawrence for Cliff Mars PE Date: 11/9/96

NYSDEC Comments:

JV

Approved: Thomas Robinson

NYSDEC Construction Inspection **Date:**

Distribution:

NYSDEC: T. Robinson
Fluor Daniel: C. Mars, S. Lawrence
Olin: J.T. Serfass, L.M. Miller, R. Taylor
OCC: L. Nigro, G. Catlin, B. Hout, J. Thornton, File

c:\excel\forms\fca102nd.xls

Project Submittal
102nd Street Landfill Site - Remedial Action
Niagara Falls, New York

Smith Environmental Technologies Corp.
800 Canonie Drive
Porter, Indiana 46304

Project Number: 96-015

Priority: ____ Normal
__X__ Urgent (ASAP)

Submittal Number: 03400-900
Submittal Description: SDMH #4 - Catch Basin (Extra)
Contract Drawing Number(s): None

Notes: Concrete used to backfill the excavation will be 4000 psi min. Conection to SDMH #4 will be made with 8" DIP using non shrink grout.
Shop drawing attached.

Certification Statement:

By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contractor requirements.

Signature: _____ **Date:** 11/21/96

Attn: Engineering Submittals
Contract No. FP-E-NI-102, Remedial Action
102nd Street Landfill Site

cc: Cliff Mars, Fluor Daniel (2)
Jack Serfass, Olin (1)
Lorraine Miller, Olin (1)
James Thornton, Oxy (1)
Tom Robinson, NYSDEC/EPA (1)

Signature: _____ **Date:** _____

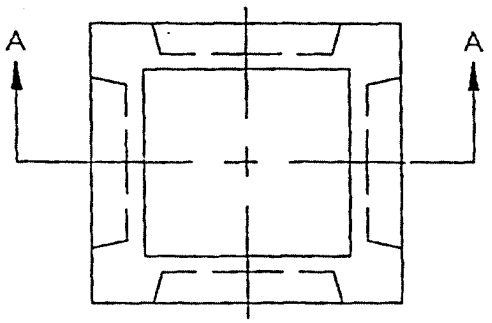
Approved (APP)	
Approved as Noted (AAN)	
Approved as Noted and Resubmit (ANR)	
Disapproved (DIS)	
Information Only (IO)	
Field Approved (FA)	

Comments: _____

KISTNER CONCRETE PRODUCTS INC. 8713 READ ROAD E. PEMBROKE, N.Y. 14056 (716) 894-2257	PRODUCT DESIGNATION	DWG. NO.
	2' SQ. X 4.5' CATCH BASIN	CB-2454 ©

SPECIFICATIONS:

CONCRETE:	4,000 P.S.I. @ 28 DAYS.
ENTRAINED AIR:	5% - 9%.
STEEL:	A.S.T.M. A496-A615 GRADE 60-60 KSI.
DESIGN LOADING:	A.A.S.H.T.O. HS-20-44 WITH 30% IMPACT AND EQUIVALENT SOIL PRESSURE OF 130 (PSF). FLOATATION FORCES NOT ACCOUNTED FOR.
WEIGHT:	3,130 LBS.



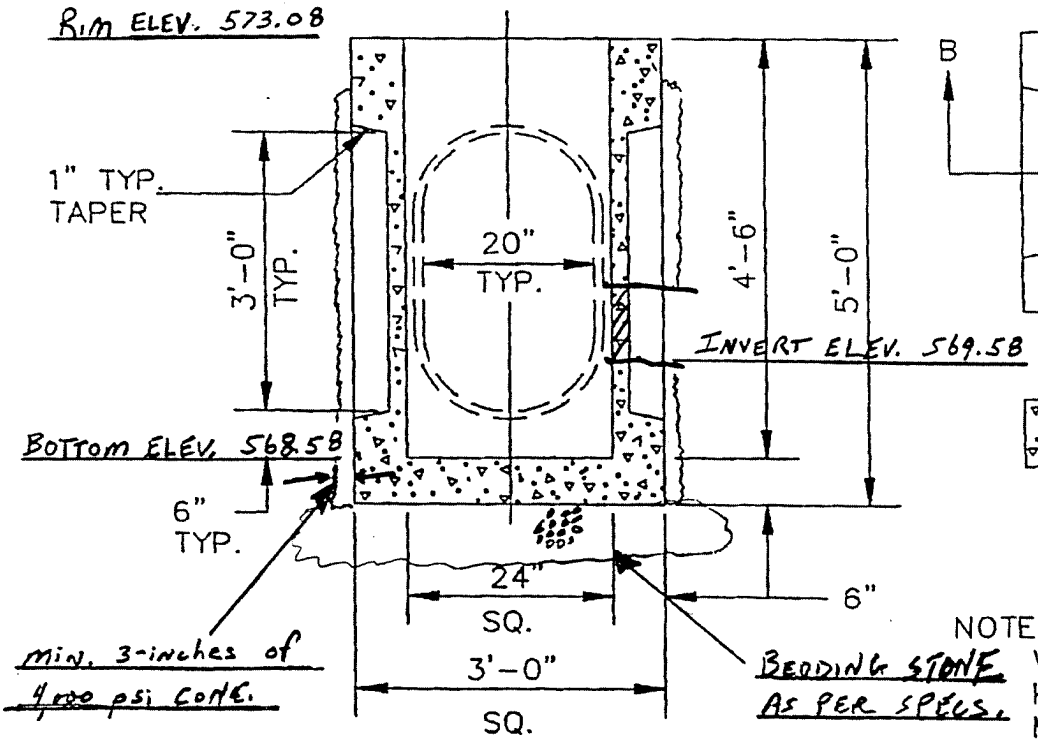
TOP VIEW

FRAME & GRATE:

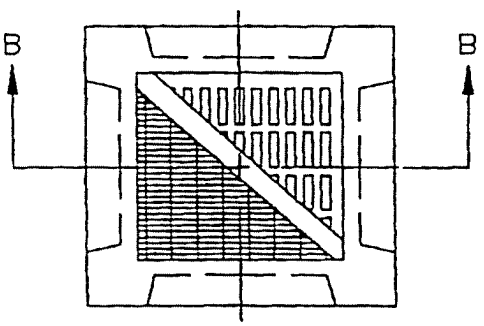
A: ☐ BY G.C..
CODE: CB315B

B: ☒ NEENAH R4832B OR EQUAL. HS20-44, BICYCLE PROOF.
CODE: CB316B

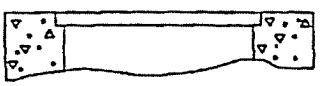
C: ☐ N.Y.S.D.O.T. RECTANGULAR 655-6R1 HS20-44, BICYCLE PROOF.
CODE: CB316BR



SECTION A-A



GRATE DET.



SECTION B-B

NOTE:
WALL THICKNESS AT KNOCKOUT TO BE 2' MINIMUM.

FIELD CHANGE APPROVAL (FCA)

Project Name:	Project Number:	AWA Number:	Date:
102nd Street Landfill			7-10-96

Identification of Area and Item:

Storm drain manholes precast alternate

Drawing Numbers: 59400-30K-04C,
59400-30K-14

BID ITEM WO# 31205-700-10E

Description of Change:

Use precast manholes and catch basins for storm sewer relocation in lieu of cast in place or block catch basins.

Authorization/Acknowledgment:

Owner's Field Construction Manager: [signature] Date: 7/11/96

Contractor's Site Representative: [signature] Date: 7/11/96

Owner's Project Managers/Environmental: [signature] 7/11/96 Date: 7/11/96

Owner's Construction QualityAssurance: Chuck Tyler Date: 7-10-96

NYSDEC Comments:

MK

Approved: [signature]

NYSDEC Construction Inspection Date: 7/15/96

Distribution:

NYSDEC: T. Robinson
Fluor Daniel: C. Mars, S. Laurence
Olin: J.T. Serfass, L.M. Miller, J. Taylor
OCC: L. Nigro, G. Catlin, B. Hout, J. Thornton, File

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FIELD CHANGE APPROVAL (FCA)

Project Name:	Project Number:	AWA Number:	Date:
102ND STREET LANDFILL			7-10-96

Identification of Area and Item:

BID ITEM 31208-700-10H

Relocation of SD MH #5

Description of Change:

"See attached Submittal Number 03400-600-C

Authorization/Acknowledgment:

Owner's Field Construction Manager: _____ Date: 7/11/96

Contractor's Site Representative: _____ Date: 7/11/96

Owner's Project Managers/Environmental: _____ Date: 7/11/96 7/11/96

Owner's Construction QualityAssurance: Chuck Taylor, PE Date: 7-10-96

NYSDEC Comments:

Approved: _____

NYSDEC Construction Inspection Date: 7/15/96

Distribution:

NYSDEC: T. Robinson Fluor Daniel: C. Mars, S. Laurence Olin: J.T. Serfass, L.M. Miller, J. Taylor OCC: L. Nigro, G. Catlin, B. Hout, J. Thornton, File

(fca102nd.xls)

Project Submittal
102nd Street Landfill Site - Remedial Action
Niagara Falls, New York

...ith Environmental Technologies Corp.
... Canonie Drive
Porter, Indiana 46304

Project Number: 96-015

Priority: x Normal
____ Urgent (ASAP)

Submittal Number: 03400-600-C
Submittal Description: Relocation of SDMH #5
Contract Drawing Number(s): 594000-30K-04 & 594000-10U-04

Notes: See attached reasoning and procedure.

Certification Statement:

By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contractor requirements.

Signature: [signature] **Date:** 7/5/96

Attn: Engineering Submittals
Contract No. FP-E-NI-102, Remedial Action
...d Street Landfill Site

cc: Cliff Mars, Fluor Daniel (2)
Jack Serfass, Olin (1)
Lorraine Miller, Olin (1)
James Thornton, Oxy (1)

Signature: Chuck Tyler, PE **Date:** 7-5-96

Approved (APP)	
Approved as Noted (AAN)	
Approved as Noted and Resubmit (ANR)	
Disapproved (DIS)	
Information Only (IO)	
Field Approved (FA)	✓

Comments:

File: 340060-1.XLS

NOTES

Submittal No. 03400-600C
Relocation of SDMH #5

Reason for change

1. The Manhole can be installed prior to interrupting the flow of the existing manhole and sewer.
2. Minimize the shut down for the existing sewer during the connection.
3. Speed up the installation of SDMH #5.

Noted 7/9/9
CT

Procedure

1. Install SDMH #5 in accordance with the specifications.
2. Remove existing manhole.
3. Excavate back to the first joint of the existing 42" RCP.
4. Install new 42" RCP from the existing 42" RCP to the new location of SDMH #5. Installation of the new 42" RCP will be in accordance with the project specifications.

"Acceptable"

4625 Witmer Rd.
NIAGARA FALLS, NEW YORK 14305
FAX (716) 282-1270

(716) 282-1218

LETTER OF TRANSMITTAL

SMITH ENVIRONMENTAL INC
BUFFALO AVE
NIAGARA FALL, NY

DATE 6/14/96 | JOB NO. 96 E

ATTENTION PETER PORTER

RE: PROPOSED RELOCATION
MANHOLE SDMH-5
OXYCHEM/OLIN
REMEDIAL DESIGN
102ND ST. LANDFILL
NIAGARA FALLS, NY

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☒ SKETCH

COPIES	DATE	NO.	DESCRIPTION
7	6/14	—	SK-RG614-1
			PROPOSED RELOCATION OF SDMH-5

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☒ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

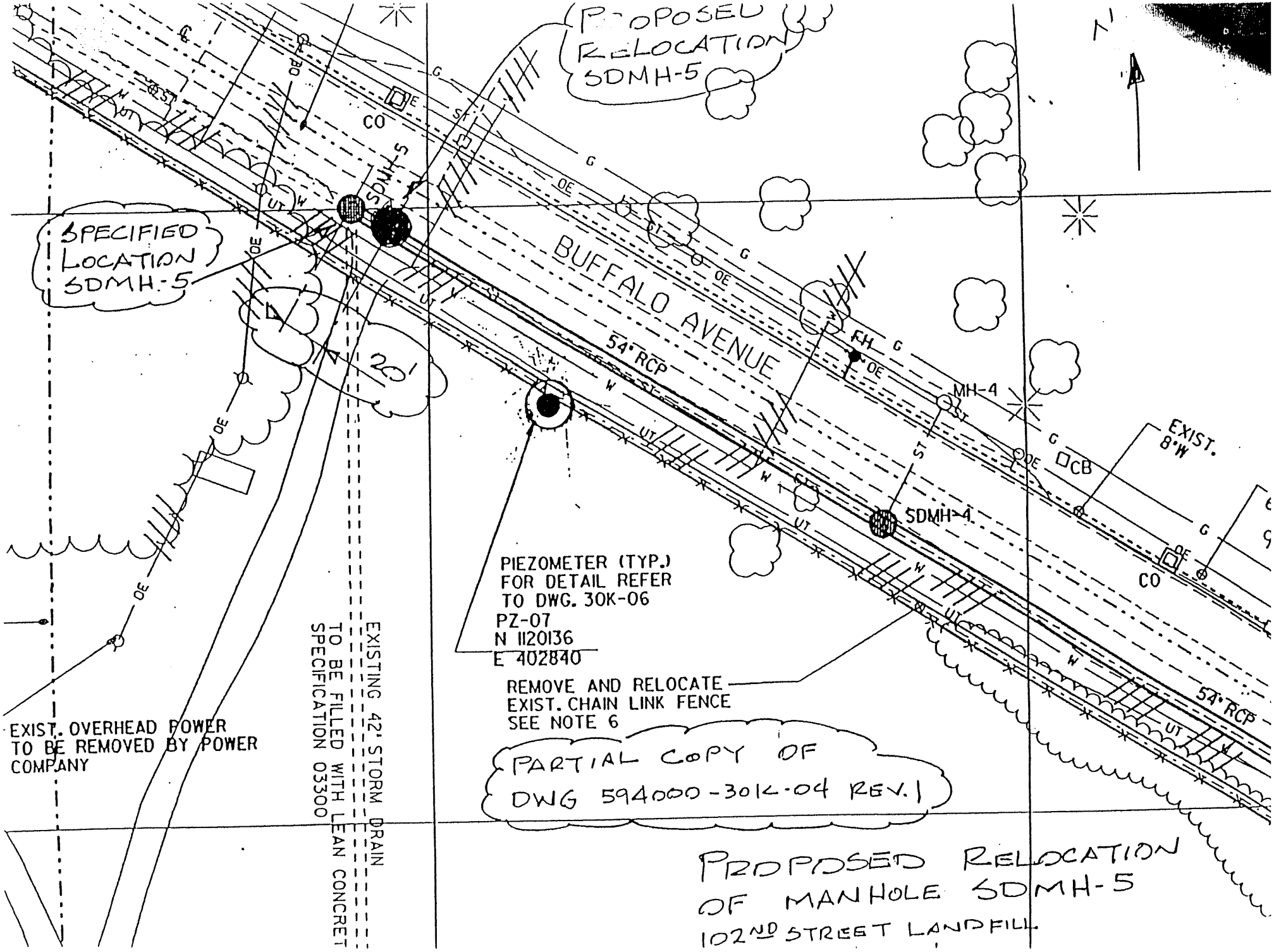
REMARKS WE PROPOSE THE RELOCATION OF SDMH-5 FOR THE FOLLOWING REASONS

1. THE MANHOLE CAN BE INSTALLED PRIOR TO INTERUPTI, FLOW OF THE EXISTING MH AND SEWER.
2. THE DEMOLITION OF THE EXISTING MANHOLE AND PIPE PLUS THE CONNECTION OF THE EXISTING 42" ϕ PIPE CAN BE PERFORMED IN MINIMAL TIME. THIS WILL MAKE THE JOB SAFER, REQUIRE LESS SHUT DOWN OF THE EXISTING SEWER AND ALLOW FOR BETTER PLANNING DUE TO SHORTER SCHEDULE.

cc TO NLW.

SIGNED: Russ Galbo

If enclosures are not as noted, kindly notify us at once


PROPOSED RELOCATION SDMH-5
SPECIFIED LOCATION SDMH-5
BUFFALO AVENUE
54" RCP
MH-4
SDMH-4
CO
CB
EXIST. 8"W
PIEZOMETER (TYP.)
FOR DETAIL REFER
TO DWG. 30K-06
PZ-07
N 1120136
E 402840
REMOVE AND RELOCATE
EXIST. CHAIN LINK FENCE
SEE NOTE 6
EXIST. OVERHEAD POWER
TO BE REMOVED BY POWER
COMPANY
EXISTING 42" STORM DRAIN
TO BE FILLED WITH LEAN CONCRET
SPECIFICATION 03300
20'
PARTIAL COPY OF
DWG 594000-30K-04 REV.1
PROPOSED RELOCATION
OF MANHOLE SDMH-5
102ND STREET LANDFILL

FIELD CHANGE APPROVAL (FCA)

Project Name:	Project Number:	AWA Number:	Date:
102nd St. Landfill	96-015		8-9-96

Identification of Area and Item:

Cast In-Place Manholes

(Formed Invert Flow Channels in SDMH #1, 4, & 5)

ITEM # 10 H

Description of Change:

Modification of the flow channel in SDMH #1, 4, & 5. For SDMH #1 a shallow invert will replace the high flow channel on the west side. For SDMH # 4 & #5 the height of the flow channel will change from full height of pipe to the spring line.

Authorization/Acknowledgment:

Owner's Field Construction Manager: Lu D Nigro Date: 8/13/96

Contractor's Site Representative: X Wilson Pelletier Date: 8-15-96

Owner's Project Managers/Environmental: JC Thornton 8/6/96 J. Serfass 8/13/96 Date:

Owner's Construction QualityAssurance: Scott Laurence Date: 8/11/96

NYSDEC Comments:

OK — Scott signed per Clifford - OK

Approved: Thomas Robinson

NYSDEC Construction Inspection Date:

Distribution:

NYSDEC: T. Robinson. Fluor Daniel: C. Mars, S. Laurence. Olin: J.T. Serfass, L.M. Miller, J. Taylor. OCC: L. Nigro, G. Catlin, B. Hout, J. Thornton, File

(fca102nd.xls)

Armand CERRONE INC.

GENERAL SITE DEVELOPMENT

4625 WITMER ROAD • NIAGARA FALLS, NEW YORK 14305 • PHONE (716) 282-1218 FAX (716) 282-1270

August 1,1996

Mr. Kevin P. O'Brien, P.E.
City Engineer
City of Niagara Falls Engineering Department
P.O. Box 69
Niagara Falls, New York 14302-0069

Re: 102 nd Street Landfill
Formed Invert Flow Channels in Storm Drainage Manholes 1, 4 and 5

Dear Mr. O'Brien,

Cerrone is in the process of building the 42" Storm Sewer relocation into the 54" RCP and 48" HDPE storm sewer along Buffalo Avenue and the east side of Olin's property. After completing the formed invert flow channels for SDMH #2 and #3 and a review of the design documents we are requesting a revision of the construction details.

For SDMH #1 we are proposing to eliminate the high bulkhead flow channel on the west side. The high bulkhead wall on the east and south sides will still be installed. On the west side we will cast a sloped shallow invert to allow access in to the manhole. If the high bulkhead were to be cast as designed the head room clearance would be restricted to 9 1/4" from the roof to the bulkhead. Refer to sketches SK-102-731-A & B for the proposed changes and SK-192-731-C & D for the original design.

For SDMH 4 & 5 we are proposing to lower the height of the bulkhead flow channel from the full height of the pipe to the spring line of the 54" RCP. This is a more normal configuration and will allow greater head room for maintenance crews. Refer to Sketches SK-102-731-E for the proposed change and Sketches SK-102-731-C & F for the original design.

Based on past experience with Smith Environmental Services and the owners, (OxyChem and Olin), we will have to obtain City acknowledgment and acceptance of the changes in writing before they will consider them. To expedite the process we are requesting your approval first. Cerrone here-in requests the Cities acceptance of the revisions to the manhole flow channels.

If you have any questions pertaining to the above please feel free to contact me at 283-4534 or Norm Williamson at 282-1218.

Sincerely yours

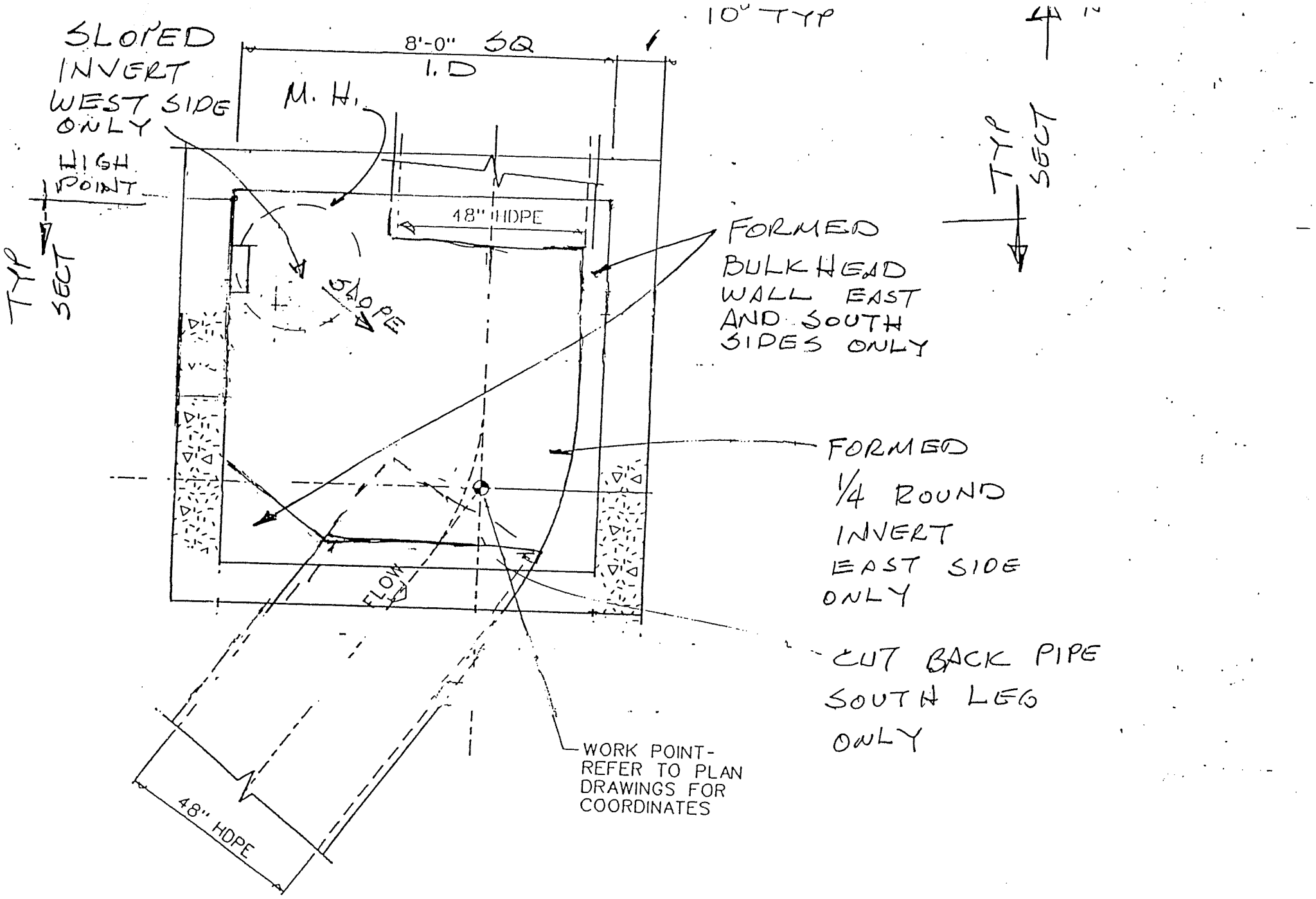
Russell R. Galbo
Project Engineer

Approved By_____ Date_____

Kevin O'Brien, P.E.
City Engineer

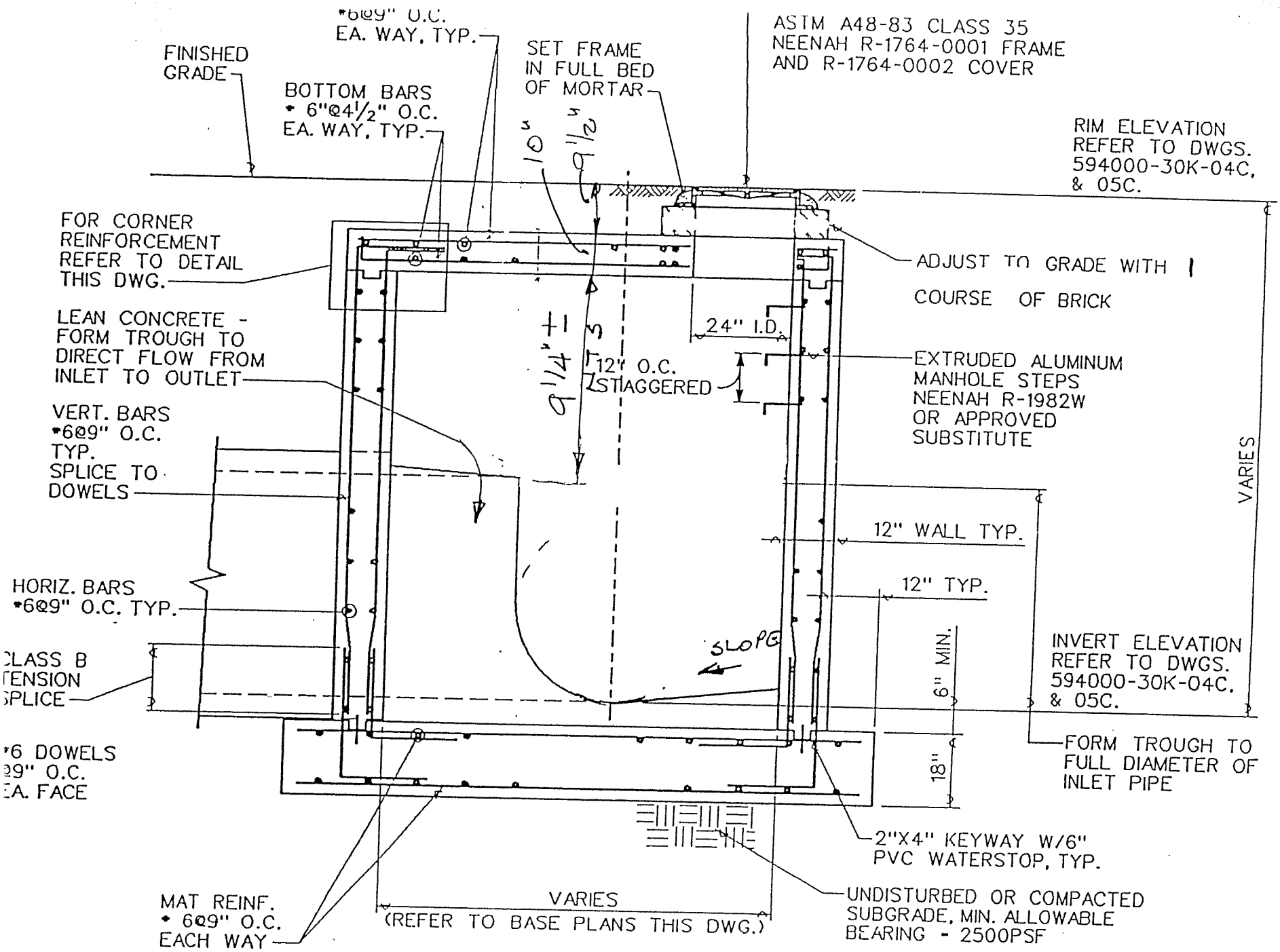
NO OPINION . . .
REFER TO DESIGN
ENGINEER - NOT
CITY.

cc: P. Porter, Chief Construction Engineer, Smith
N. Williamson, ACI
W. Dempsey, ACI
File - 96E



DWG SK-102-731-A
R4

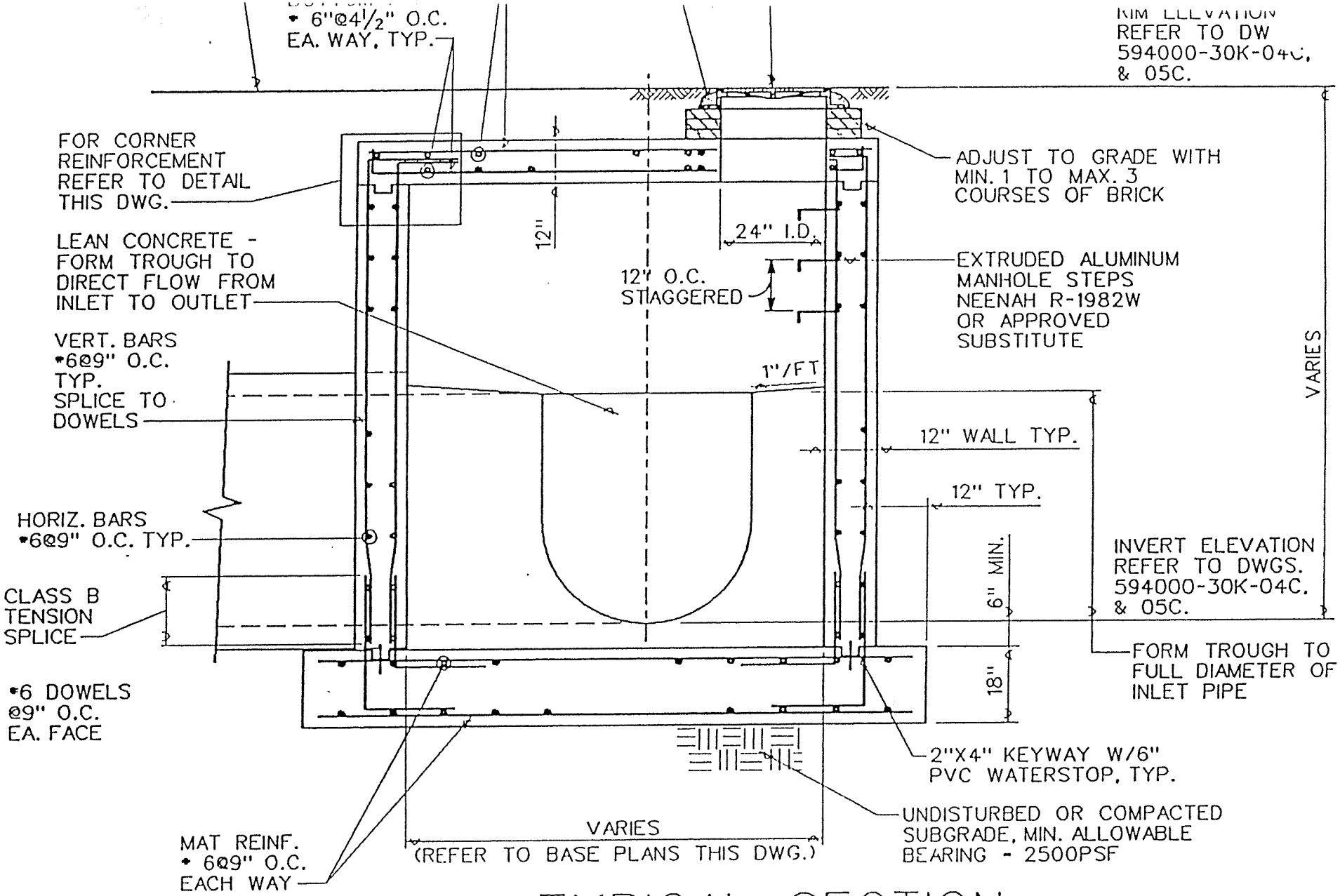
PLAN - BASE SECTION MH #1



TYPICAL SECTION

MANHOLE SDMH-1

DWG
SK-102-731-B
DM



TYPICAL SECTION

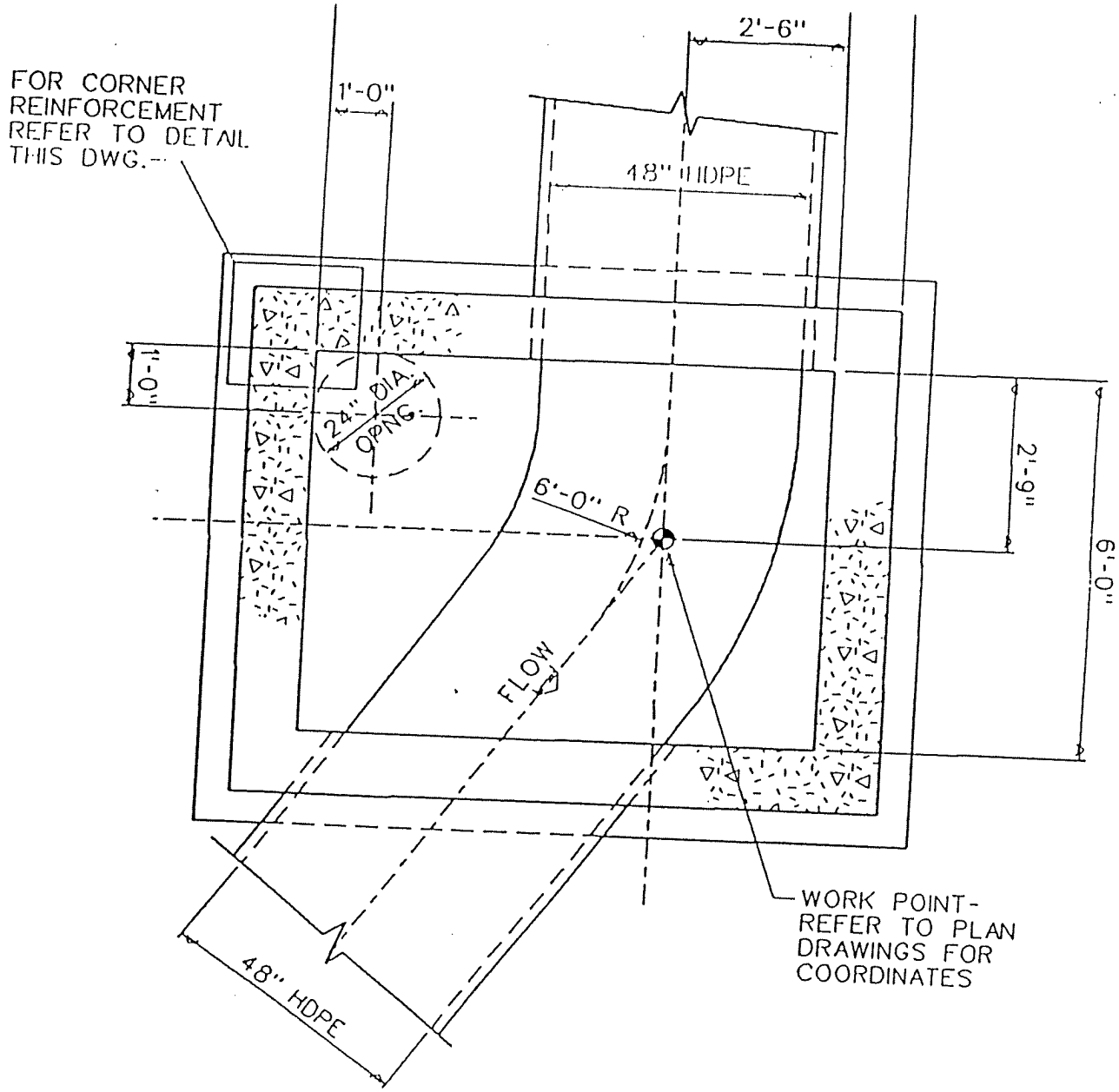
MANHOLES SDMH-1,3,4 & 5

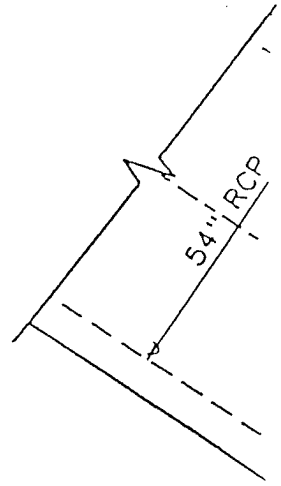
N.T.S.

DWG SK-102-731-C

RA

RR 5



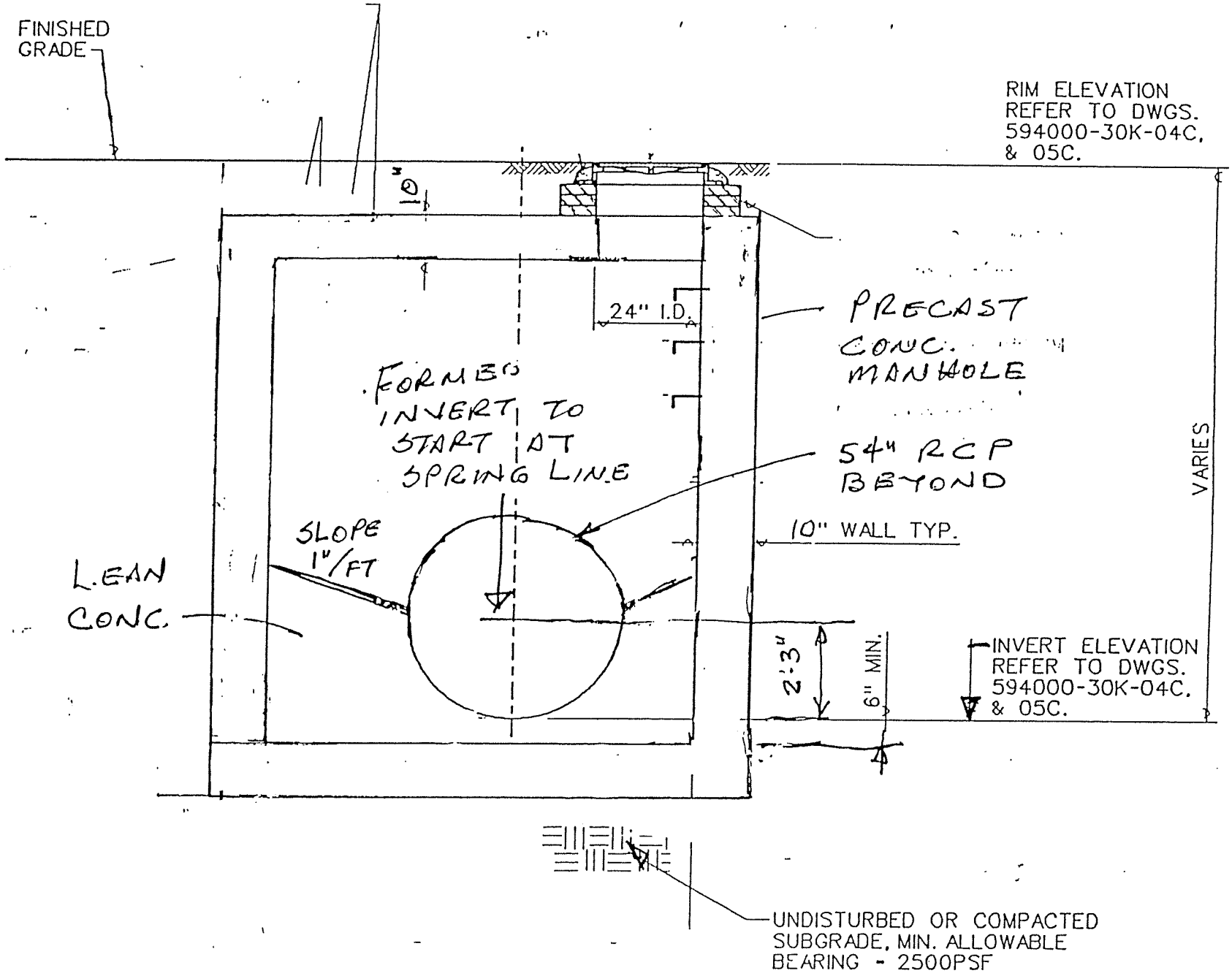


PLAN - BASE SECTION
MANHOLE SDMH-1

N.T.S.

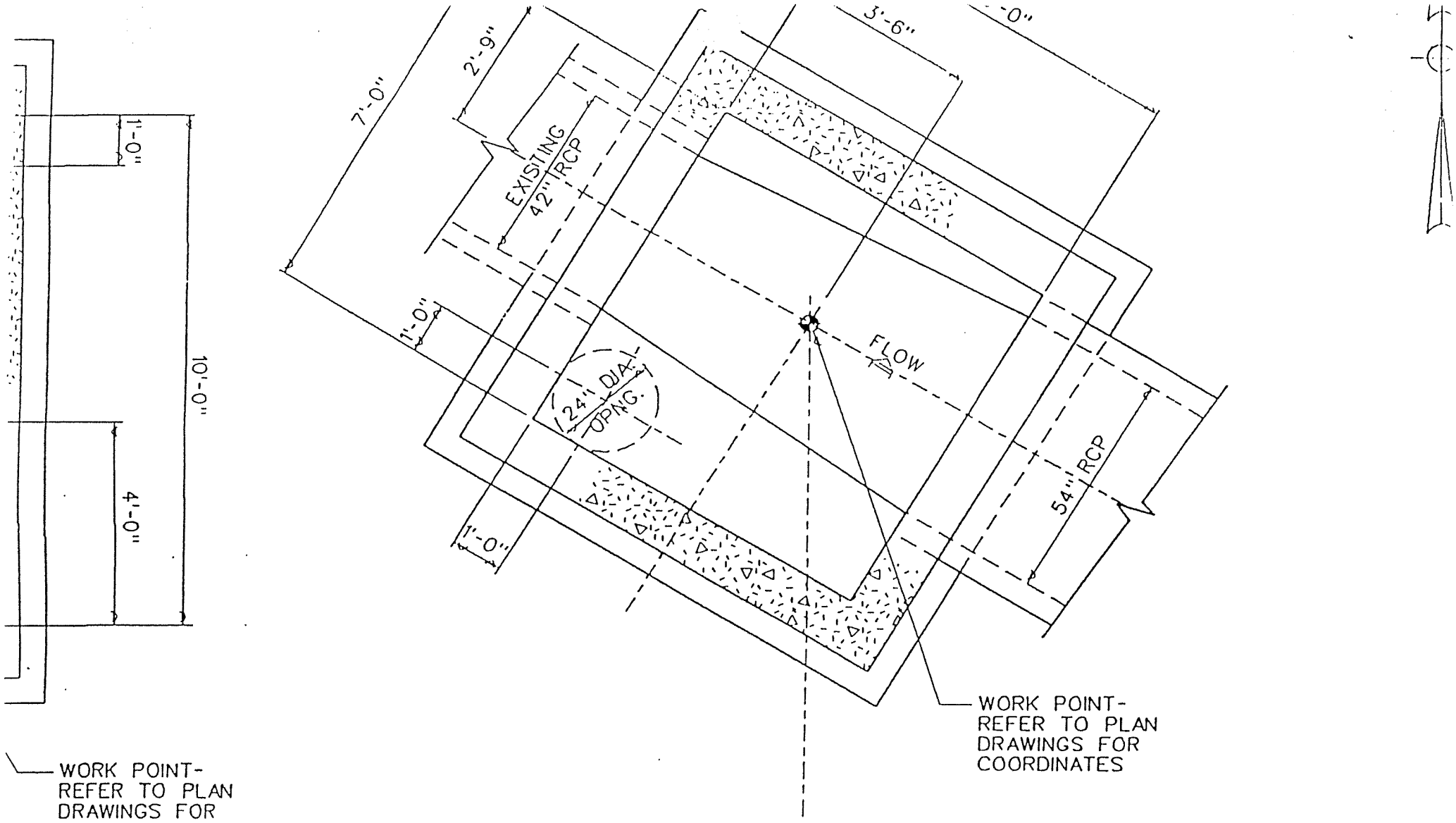
Dwg
5k-102-731-D
RH

Pl



TYPICAL SECTION

DWG - 5K-102-731-E



PLAN - BASE SECTION

MANHOLE SDMH-5

(SDMH-4 SIMILAR)

NTS

DWG
SK-102-731-F
R4

Project Submittal
102nd Street Landfill Site - Remedial Action
Niagara Falls, New York

Smith Environmental Technologies Corp.
700 Canonie Drive
Porter, Indiana 46304

Project Number: 96-015

Priority: ____ Normal
__X__ Urgent (ASAP)

Submittal Number: 03400 - 600A
Submittal Description: Storm Drain Manholes (SDMH #1, 3, 4, and 5) Precast Alternate
Contract Drawing Number(s): 59400 - 30k -04C, 30K - 05C, 30K - 14

Notes: City of Niagara Falls Approval Letter
Data was submitted on May 10th.

Certification Statement:

By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contractor requirements.

Signature: _____ **Date:** 6/7/96

Attn: Engineering Submittals
Contract No. FP-E-NI-102, Remedial Action
102nd Street Landfill Site

cc: Cliff Mars, Fluor Daniel (2)
Jack Serfass, Olin (1)
Lorraine Miller, Olin (1)
Tom Nowocien , Oxy (1)

Signature: _____ **Date:** _____

Approved (APP)	☐
Approved as Noted (AAN)	☐
Approved as Noted and Resubmit (ANR)	☐
Disapproved (DIS)	☐
Information Only (IO)	☐
Field Approved (FA)	☐

Comments: _____

File: SUBSHT XLS

4520 WITT ROAD • NIAGARA FALLS, NEW YORK 14305 • PHONE (716) 283-1316 FAX (716) 283-1270

May 30, 1996

Mr. Kevin P. O,Brien, P.E.
City Engineer
City of Niagara Falls Engineering Department
P.O. Box 69
Niagara Falls, New York 14302-0069

Re: 102nd Street landfill use of precast manholes and catch basins for storm sewer relocation.

Dear Mr. O'Brien;

Armand Cerrone Construction Company inc. is hereby requesting approval to utilize precast manholes and catch basins in lieu of cast in place or block catch basins for the above noted project. All material and structural loading requirements will meet or exceed project specifications in accordance to City of Niagara Falls requirements and pending approval of shop drawings sent to the Design Engineer Flour Daniels.

If you should have any questions please contact our office.

Approved by _____
Kevin O'Brien P.E.
City Engineer

Approved By _____
Flour Daniels
Design Engineer

Sincerely;

Nick V. Soroka

Nick V. Soroka
Project Engineer

FIELD CHANGE APPROVAL (FCA)

Project Name:	Project Number:	AWA Number:	Date:
102ND STREET LANDFILL			8/27/96 ~~7/29/96~~

Identification of Area and Item:

Temp. 48" HDPE Storm Sewer Extension.

Description of Change:

CULVERT UNDER COFFERDAM IS AN ALLOWABLE METHOD to allow Storm water to Reach River. CULVERT will replace entire length of pipe.

Authorization/Acknowledgment:

Owner's Field Construction Manager: Lou D Nigro Date: 9/5/96

Contractor's Site Representative: [signature] Date: 9/5/96

Owner's Project Managers/Environmental: J C Thornton 9/5/96 Date:

Owner's Construction QualityAssurance: Scott Laurence for Cliff Mars, P.E. Date: 8/27/96

NYSDEC Comments:

Approved:

NYSDEC Construction Inspection Date:

Distribution:

NYSDEC: T. Robinson
Fluor Daniel: C. Mars, S. Laurence
Olin: J.T. Serfass, L.M. Miller, J. Taylor
OCC: L. Nigro, G. Catlin, B. Hout, J. Thornton, File

(fca102nd.xls)

FIELD CHANGE APPROVAL (FCA)

Project Name:	Project Number:	AWA Number:	Date:
102ND STREET LANDFILL			8/27/96 ~~8/29/96~~

Identification of Area and Item:

Storm Sewer MH-1

Description of Change:

Rim Elevation was raised to elevation 572.5 due to slurry WALL re-alignment/re-gradding.

Authorization/Acknowledgment:

Owner's Field Construction Manager: Lee D Nigro Date: 9/5/96

Contractor's Site Representative: Date: 9/5/96

Owner's Project Managers/Environmental: JC Thornton 9/5/96 Date:

Owner's Construction QualityAssurance: Scott Laurence for Cliff Mans, PE Date: 8/27/96

NYSDEC Comments:

Approved:

NYSDEC Construction Inspection Date:

Distribution:

NYSDEC: T. Robinson
Fluor Daniel: C. Mars, S. Laurence
Olin: J.T. Serfass, L.M. Miller, J. Taylor
OCC: L. Nigro, G. Catlin, B. Hout, J. Thornton, File

(fca102nd.xls)

DRAWINGS

ABBREVIATIONS

@	AT
&	AND
316SS	316 STAINLESS STEEL
AIT	ANALYZER INDICATING TRANSMITTER
ALT	ALTERNATE
APL	AQUEOUS PHASE LIQUID
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
B_L	BASE LINE
BLDG	BUILDING
BM	BENCH MARK
BOT	BOTTOM
B/C	BOTTOM OF CURB
$\mathcal{C}$	CENTERLINE
CB	CATCH BASIN
CJ	CONTROL JOINT
CI	CURB INLET
CIP	CAST IRON PIPE
CLR	CLEAR
CO	CLEANOUT
CONC	CONCRETE
CONST JT	CONSTRUCTION JOINT
COORD	COORDINATE
DEPT	DEPARTMENT
DET	DETAIL
DI	DUCTILE IRON
DIA, ø	DIAMETER
DIP	DUCTILE IRON PIPE
DWG	DRAWING
E	EAST
EA	EACH
EL	ELEVATION
ELEC	ELECTRIC
ET	ELECTRIC TRACING
EW	EACH WAY
EXIST	EXISTING
EXP	EXPANSION
EXP JT	EXPANSION JOINT
EXT	EXTERIOR
FL	FLOW LINE
FI	FIBERGLASS REINFORCED PLASTIC
FB	FLAT BOTTOM
FIN FL EL	FINISHED FLOOR ELEVATION
FIN GR	FINISHED GRADE
FH	FIRE HYDRANT
FQI	FLOW TOTALIZER INDICATOR
FT	FEET
G	GAS
GCL	GEOSYNTHETIC CLAY LINER
GP	GUARD POST
GR	GUARDRAIL
HDPE	HIGH DENSITY POLYETHYLENE
HORIZ	HORIZONTAL
HP	HIGH POINT
HS	HAND SWITCH
HW	HEADWALL
ID	INSIDE DIAMETER
IFC	ISSUED FOR CONSTRUCTION
IN	INSULATION
INFO	INFORMATION
IP	IRON PIN
INV	INVERT
INV EL (IE)	INVERT ELEVATION
JT	JOINT
L	LENGTH (OF CURVE)
LAH	LEVEL ALARM HIGH
LDS	LEVEL DIFFERENTIAL SWITCH
LE	LEVEL ELEMENT
LF	LINEAR FEET
LIT	LEVEL INDICATOR TRANSMITTER
LP	LIGHT POLE
LR	LEVEL RECORDER
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LSL	LEVEL SWITCH LOW
LT	LEVEL TRANSMITTER
MAX	MAXIMUM
MECH	MECHANICAL
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
N	NORTH
NAPL	NON-AQUEOUS PHASE LIQUID
NGVD	NATIONAL GEODETIC VERTICAL DATUM OF 1929
(NIC)	NOT IN CONTRACT
# OR NO.	NUMBER
NTS	NOT TO SCALE
NYSDOT	NEW YORK STATE DEPARTMENT OF TRANSPORTATION
OC	ON CENTER(S)
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
PL	PROPERTY LINE
PG	PRESSURE GAUGE
PI	POINT OF INTERSECTION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
QTY	QUANTITY
R, RAD	RADIUS
RCP	REINFORCED CONCRETE PIPE
REV	REVISION
REINF	REINFORCED
REQD	REQUIRED
R/W	RIGHT OF WAY
R.O.W.	RIGHT OF WAY
S	SOUTH
SCH	SCHEDULE
SD	STORM DRAIN (NEW)
SDSP	SUBDRAIN COLLECTION PIPE
SECT	SECTION
SHT	SHEET
SQ	SQUARE
SSI's	SITE SPECIFIC INDICATORS
ST	STORM DRAIN (EXISTING)
STA	STATION
STD	STANDARD
STRUCT	STRUCTURAL
SYM	SYMMETRICAL
TBD	TO BE DETERMINED
T/C	TOP OF CURB
T/CONC	TOP OF CONCRETE
T/G	TOP OF GRATE
THK	THICK(NESS)
TYP	TYPICAL
UD	UNDERDRAIN
UESC	NEW YORK GUIDELINES FOR URBAN EROSION AND SEDIMENT CONTROL
U/G	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VLDPE	VERY LOW DENSITY POLYETHYLENE
W	WEST
W/	WITH
WP	WORKING POINT
WWF	WELDED WIRE FABRIC
XA	REMOTE PHONE DIALER
YD	YARD

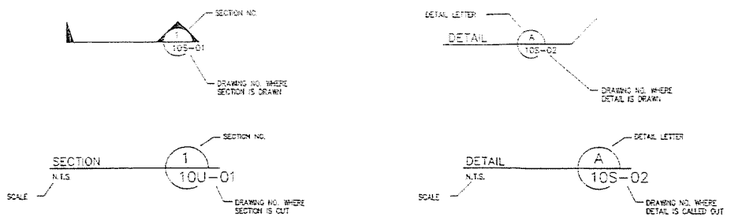
P & ID LEGEND

- FLOW LINE
- ELECTRIC LINE
- FIELD MOUNTED INSTRUMENT
- GATE, BALL, OR GLOBE HAND VALVE
- CHECK VALVE
- INTERLOCK
- CENTRIFUGAL PUMP
- ELECTRIC MOTOR
- CONCENTRIC REDUCER / INCREASER
- SUBMERSIBLE PUMP
- FLANGE
- FLOW TOTALIZER INDICATOR
- REMOTE PHONE DIALER
- CONTROL PANEL MOUNTED INSTRUMENT
- HEAT TRACED AND INSULATE
- REMOVABLE ELECTRIC PANEL COIL HEATERS WITH REMOVABLE INSULATION
- CARBON FILTER

LEGEND

	EXISTING	NEW
APL COLLECTION TRENCH		
BUILDING		
CATCH BASIN	CB	CB
CITY WATER LINE	W	W
CLEANOUT (UNDERDRAIN)	CO	CO
CLEANOUT (APL COLLECTION TRENCH)		CO-1
COFFERDAM $\mathcal{C}$		
DIGGIN CONTAINING SOIL	ITSOW 30K-028	
CONTOUR	340	340
CURTAIN WALL		
DOUBLE WALL PIPE		
DRAINAGE FLOW		
EASEMENT (PERMANENT)		
EASEMENT (CONSTRUCTION)		
CHAIN LINK FENCE	X	
FIRE HYDRANT	FH	FH
FORMER EMBANKMENT AREA		
GAS LINE	G	G
GUARD POST	GP	GP
HEADWALL	HW	HW
100 YEAR FLOOD LIMIT		FL
INLINE MANHOLE CLEANOUT (APL SYSTEM)		CO-MH1
IRON PIN	IP	
LEVEL SPREADER		
LIGHT POLE	LP	LP
MANHOLE		
MONUMENT	MON	
NAPL RECOVERY WELL		NR-1
OVERHEAD ELECTRIC POWER & POLE	OE P OE	OE P OE
PIEZOMETER WELL		PZ-1
POST CLOSURE MONITORING WELL		POW-01
PROPERTY LINE	PL	PL
REMOVED/ABANDON UNDERGROUND LINES		
RIGHT OF WAY		
RIVER LEVEL GAUGE		
SEDIMENT EXCAVATION AREA (2' DEEP)		
SEDIMENT EXCAVATION AREA (3' DEEP)		
SIGN		
SILT CURTAIN		
SILT FENCE	S/F	
SLOPE LINE		
SLURRY WALL	SEE 30K-01A	
STABILIZED CONSTRUCTION ENTRANCE (SYMBOL)		
SPOT ELEVATION	± 576.2	+ 596.00
STONE OUTLET SEDIMENT TRAP (SYMBOL)		

	EXISTING	NEW
STORM DRAIN LINE	ST	SD
SUBDRAIN COLLECTION PIPE		SDP
SWALE		
TEMPORARY DIVERSION BERM & SWALE		
TREE – CONIFEROUS		
TREE – DECIDUOUS		
TREE LINE		
TREE PROTECTION (TEMPORARY)		
UNDERGROUND INSTRUMENTATION LINE		UG
UNDERGROUND ELECTRIC POWER		UE
UNDERGROUND TELEPHONE LINE	UT	UT
VALVE	V	V
WATERSHED DRAINAGE DIVIDE		
WET WELL		



DETAILS AND SECTIONS CALLOUT SYMBOLOGY

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEW YORK — CHARLES TAYLOR — 072004

6-23-98

REV.	DATE	REVISION DESCRIPTION	DES. CHK.	APPROVED
A	01/29/93	ENGINEERING REPORT SUBMITTAL (PRELIMINARY/INTERMEDIATE)	PTG	DRK
B	03/15/95	ISSUED FOR REFERENCE		JTG
C	09/15/95	FINAL ENGINEERING REPORT (DRAFT SUBMITTAL)		RM
0	12/21/95	ISSUED FOR BID		
1	9/5/96	ISSUED FOR CONSTRUCTION		
2	6/16/98	STORM SEWER AS-BUILTS; REMEDIAL ACTION REPORT (FINAL) W/ RESPONSES TO AGENCY COMMENTS		

REV.	DATE	REVISION DESCRIPTION	DES. CHK.	APPROVED	DWG NO.	REFERENCE DRAWINGS	DWG NO.	REFERENCE DRAWINGS

FLUOR DANIEL

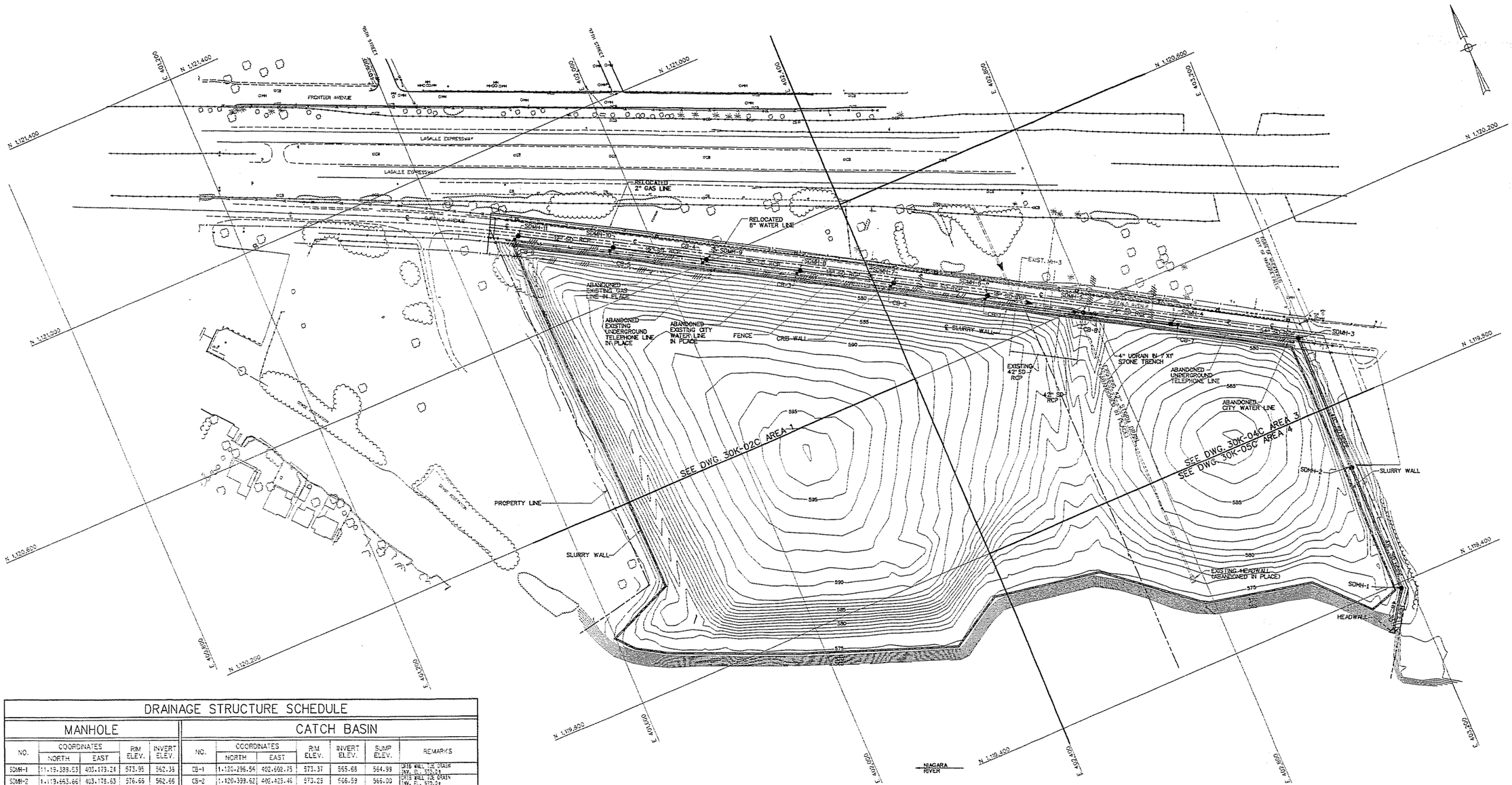
DESIGNED BY	K. BARBER
CHECKED BY	B. BOND
SUPERVISOR	J. GERVAIS
RELEASE DATE	
LEAD ENGR./OFFICE	C. TAYLOR
DETAILS	
PROJECT	R. MARKOWSKI
APP. DATE	9/13/95
CLIENT	OXYCHEM / OLIN
APP. DATE	

OXYCHEM / OLIN
REMEDIAL DESIGN
102nd STREET LANDFILL SITE
NIAGARA FALLS, NEW YORK

LEGEND AND ABBREVIATIONS

SCALE: NONE | DRAWING NUMBER: 594000-10Z-02 | REV. 2

MANUAL CHANGES MADE – YES ☐ NO ☐ | DWG. FILE UPDATED – YES ☐ NO ☐ | MODEL UPDATED – YES ☐ NO ☐ | CADD DRAWING No. 10210Z02.DWG 6/16/98



DRAINAGE STRUCTURE SCHEDULE

MANHOLE

NO.	COORDINATES NORTH	COORDINATES EAST	RIM ELEV.	INVERT ELEV.
SDMH-1	1,119,388.23	403,179.24	573.95	562.36
SDMH-2	1,119,663.66	403,178.63	576.66	562.66
SDMH-3	1,119,961.01	403,183.66	574.76	562.71
SDMH-4	1,120,093.49	402,946.31	574.23	563.34
SDMH-5	1,120,187.99	402,785.28	573.48	563.66
SDMH-6	1,120,301.27	402,610.47	574.44	564.72
SDMH-7	1,120,403.76	402,436.62	574.43	565.41
SDMH-8	1,120,505.25	402,266.64	574.43	568.64
SDMH-9	1,120,605.63	402,093.30	574.22	567.60
SDMH-10	1,120,705.59	401,919.73	573.77	568.32
SDMH-11	1,120,806.04	401,746.36	573.49	569.15

CATCH BASIN

NO.	COORDINATES NORTH	COORDINATES EAST	RIM ELEV.	INVERT ELEV.	SUMP ELEV.	REMARKS
CB-1	1,120,296.56	402,602.75	573.37	565.68	564.99	CRIB WALL TOE DRAIN INV. EL. 570.68
CB-2	1,120,399.62	402,423.46	573.23	566.59	565.00	CRIB WALL TOE DRAIN INV. EL. 570.68
CB-3	1,120,502.74	402,256.81	573.35	567.54	566.70	CRIB WALL TOE DRAIN INV. EL. 570.68
CB-4	1,120,602.40	402,083.34	573.31	568.57	567.67	CRIB WALL TOE DRAIN INV. EL. 570.68
CB-5	1,120,702.15	401,910.98	572.81	569.03	568.06	CRIB WALL TOE DRAIN INV. EL. 569.53
CB-6	1,120,802.94	401,735.72	572.66	569.66	568.55	CRIB WALL TOE DRAIN INV. EL. 569.03
CB-7	1,120,096.30	402,059.90	572.37	563.50	563.66	CRIB WALL TOE DRAIN INV. EL. 563.03
CB-8	1,120,196.50	402,768.70	573.63	568.79	568.12	4" PIPE FROM UNDERDRAIN INV. ELEV. 569.48

MONUMENT TABULATION (BENCH MARKS)

NORTHWEST MONUMENT (NAD 27) NYSPC NORTH 1,120,792.586 EAST 401,761.139
ELEV. NGVD 1929 = 573.22

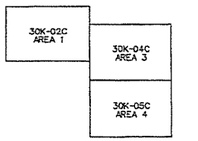
NORTHEAST MONUMENT (NAD 27) NYSPC NORTH 1,119,985.971 EAST 403,165.131
ELEV. NGVD 1929 = 574.86

GENERAL NOTES:

1. REFER TO DWGS. 594000-30K-02C, 04C AND 05C FOR PLANS DEPICTING STORM DRAINAGE LAYOUT.
2. REFER TO DWGS. 594000-30K-13 AND 14 FOR STORM DRAINAGE DETAILS.
3. REFER TO DWG. 594000-10Z-02 FOR LEGEND & ABBREVIATIONS.

LIST OF EXISTING UTILITIES

UTILITY	OWNING UTILITY/AGENCY
1. CITY WATER	CITY OF NIAGARA FALLS, NEW YORK
2. GAS	NATIONAL FUEL GAS CORPORATION
3. TELEPHONE	NEW YORK TELEPHONE
4. POWER	NIAGARA MOHAWK POWER CORPORATION
5. CABLE TV	NIAGARA FRONTIER CABLE TELEVISION
6. STORM SEWER	CITY OF NIAGARA FALLS AND TOWN OF WHEATFIELD, NY



DRAWING KEY PLAN - ENLARGED DRAWINGS

0 80 160 FT.

REV.	DATE	REVISION DESCRIPTION	DES. CHK.	APPROVED
A	9/29/94	ISSUED FOR REVIEW AND APPROVAL (STORM DRAINAGE)		
0	3/15/95	ISSUED FOR CONSTRUCTION (STORM DRAINAGE)		STD
1	3/3/95	FINAL ENGINEERING REPORT (DRAFT SUBMITTAL)		
2	12/21/95	ISSUE FOR BID		
3	2/5/96	ISSUED FOR CONSTRUCTION		
4	06/7/96	REVISED SLURRY WALL LOCATION IN S.E. CORNER		
5	3/12/97	STORM SEWER AS-BUILTS		
6	8/13/97	ADDED STORM SEWER CB-8 INTO IN TO SDMH-5 AND 4" UDRAIN INTO IN TO CB-8		
7	1/09/98	STORM SEWER AS-BUILTS REMEDIAL ACTION REPORT (FINAL)		
8	6/18/98	STORM SEWER AS-BUILTS REMEDIAL ACTION REPORT (FINAL) W/ RESPONSES TO AGENCY COMMENTS		

DWG. NO.: 594000-10Z-02 — LEGEND AND ABBREVIATIONS

REFERENCE DRAWINGS

FLUOR DANIEL

DESIGNED BY	BARGER/GERVAIS
CHECKED BY	J. GERVAIS
DRAWN FOR	J. GERVAIS
RELEASE DATE	
LEAD ENGR./SPEC.	C. TAYLOR
INITIALS	
PROJECT	R. MARGUCCIO
APP. DATE	
CLIENT	OXYCHEM/OLIN

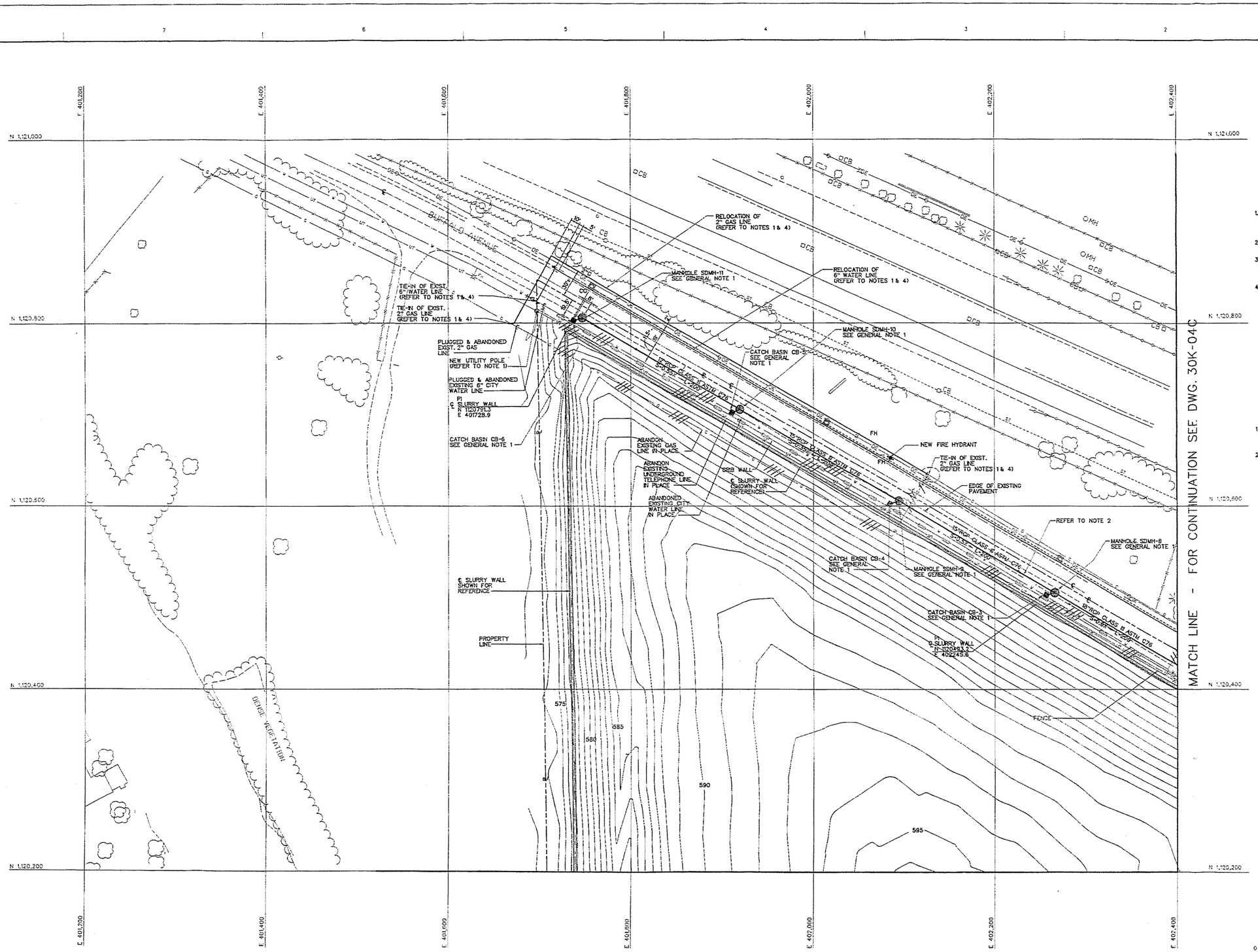
OXYCHEM/OLIN
REMEDIAL DESIGN
102nd STREET LANDFILL SITE
NIAGARA FALLS, NEW YORK

MASTER SITE REMEDIATION PLAN
STORM DRAINAGE

SCALE 1"=80' | DRAWING NUMBER 594000-30K-01C | REV. 8

MANUAL CHANGES MADE - YES ☐ NO ☐ DWG. FILE UPDATED - YES ☐ NO ☐ MODEL UPDATED YES ☐ NO ☐ CADD DRAWING No. 1023K1C

6-2378

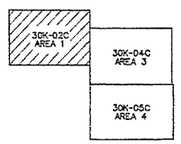


NOTES:

1. EXISTING GAS LINE, TELEPHONE LINE, OVERHEAD ELECTRICAL LINE AND CABLE TV LINE TO BE RELOCATED AND INSTALLED BY THE OWNING UTILITY/ AGENCY.
2. ALL REINFORCED CONCRETE PIPE (RCP) SHALL BE IN CONFORMANCE WITH ASTM C 76, CLASS III.
3. ALL STORM DRAINAGE WITHIN THE R.O.W. SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF NIAGARA FALLS, ENGINEERING DEPARTMENT STANDARD SPECIFICATIONS.
4. PRIOR TO WORK ACTIVITIES, THE PUBLIC UTILITY COMPANIES WILL BE NOTIFIED BY THE OWNER OF IMPENDING OPERATIONS. UPON AWARD OF CONTRACT, THE CONTRACTOR SHALL NOTIFY EACH UTILITY OF THE WORK SCHEDULE AND COORDINATE ACTIVITIES WITH THE UTILITY COMPANIES. ALL UNDERGROUND UTILITIES WITHIN THE WORK AREA SHALL BE SUITABLY MARKED BY THE UTILITIES COMPANIES. EXCAVATION AROUND AND WITHIN 2 FEET OF BURIED UTILITIES, ABOVEGROUND APPURTENANCES AND UTILITY POLES SHALL BE PERFORMED BY USE OF HAND TOOLS. PROVIDE SUITABLE PROTECTION FOR ALL UTILITIES. EXCAVATIONS DEEPER THAN 18 INCHES ADJACENT TO UTILITY POLES SHALL BE SLOPED AT 1H FROM THE EDGE OF THE POLE. NO MORE THAN 18 INCHES OF THE BURIED SECTION OF THE POLE SHALL BE UNEARTHED WITHOUT TEMPORARY SUPPORT AS APPROVED BY THE UTILITY.

GENERAL NOTES:

1. REFER TO DWG. NO. 594000-30K-11, 13 AND 14 FOR STORM DRAINAGE SECTIONS AND DETAILS AND DWG. NO. 594000-30K-01C FOR STORM DRAINAGE STRUCTURE SCHEDULE.
2. REFER TO DWG. 594000-10Z-02 FOR LEGEND AND ABBREVIATIONS.



DRAWING KEY PLAN

0 40 80 FT.

REV.	DATE	REVISION DESCRIPTION	DES. CHK.	APPROVED
A	9/29/94	ISSUED FOR REVIEW AND APPROVAL (STORM DRAINAGE)		JTG
0	3/15/95	ISSUED FOR CONSTRUCTION (STORM DRAINAGE)		JTG
1	8/8/95	FINAL ENGINEERING REPORT (DRAFT SUBMITTAL)		
2	12/15/95	ISSUED FOR BID		
3	2/5/96	ISSUED FOR CONSTRUCTION		
4	3/12/97	STORM SEWER AS-BUILTS		
5	3/18/98	STORM SEWER AS-BUILTS- REMEDIAL ACTION REPORT (FINAL)		
6	6/8/98	STORM SEWER AS-BUILTS- REMEDIAL ACTION REPORT (FINAL) W/ RESPONSES TO AGENCY COMMENTS		

DWG NO.	REFERENCE DRAWINGS	DWG NO.	REFERENCE DRAWINGS
		594000-10Z-02C	LEGEND AND ABBREVIATIONS

FLUOR DANIEL

DESIGNED BY	BARBER/GERVAIS
CHECKED BY	J.GERVAIS
SUPERVISOR	J.GERVAIS
RELEASE DATE	
LEAD ENGR./SPEC.	C. TAYLOR
PROJECT	R. MARGUCCIO
CLIENT	OXY-CHEM/OLIN
APPROVED	
APPROVED	

OXYCHEM/OLIN
REMEDIAL DESIGN
102nd STREET LANDFILL SITE
NIAGARA FALLS, NEW YORK

SITE REMEDIATION PLAN AREA 1
STORM DRAINAGE

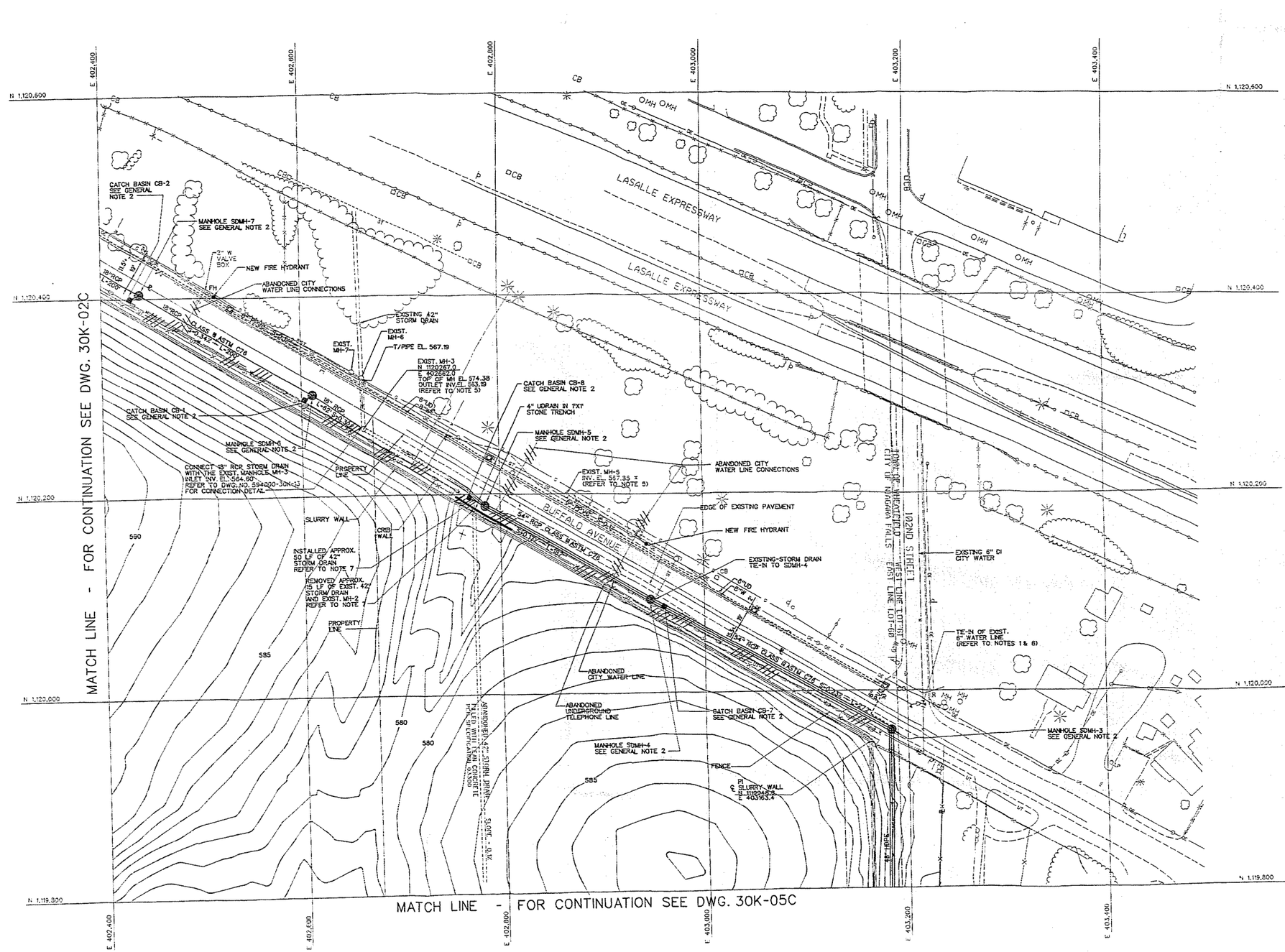
SCALE	DRAWING NUMBER	REV.
1"=40'	594000-30K-02C	6

REDUCED PRINT SCALES

SUB-CONTRACT PKG.

WORK PKG.

DIST. CODE



NOTES:

1. EXISTING GAS LINE, TELEPHONE LINE, OVERHEAD ELECTRICAL LINE, CABLE TV LINE AND WATER LINE TO BE RELOCATED AND INSTALLED BY THE OWNING UTILITY/AGENCY.
2. 48" DIA HDPE STORM DRAIN SHALL BE IN CONFORMANCE WITH ASTM F-894, SPIROLITE CLASS 40 OR APPROVED EQUAL PIPE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

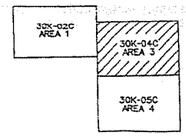
   ALL REINFORCED CONCRETE PIPE (RCP) SHALL BE IN CONFORMANCE WITH ASTM C 76, CLASS III.
3. ALL STORM DRAINAGE WITHIN THE R.O.W. SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF NIAGARA FALLS, ENGINEERING DEPARTMENT STANDARD SPECIFICATIONS.
4. THE NUMBERING SYSTEM FOR EXISTING MANHOLES IS TAKEN FROM A REPORT ENTITLED "FINAL REPORT, UTILITIES INVESTIGATION/RECORD SEARCH PHASE, 102nd STREET REMEDIAL INVESTIGATION, NIAGARA FALLS, NEW YORK", PREPARED BY WOODWARD-CLYDE CONSULTANTS, 5120, BUTLER PIKE, PLYMOUTH MEETING, PA 19462, DATED JULY 15, 1985.

   RIM AND INVERT ELEVATIONS FOR EXISTING MANHOLES (WHERE SHOWN) ARE TAKEN FROM A TOPOGRAPHIC SURVEY PERFORMED BY McINTOSH & McINTOSH, P.C., CONSULTING ENGINEERS, BUFFALO, NEW YORK, DATED 5/11/92.
5. INVERT ELEVATIONS OF EXISTING APPURTENANCES, SHOWN WITH AN ASTERISK (*) ARE CITY OF NIAGARA FALLS DATUM.

   NOTE: NIAGARA FALLS DATUM=USGS DATUM -0.XX
6. PRIOR TO WORK ACTIVITIES, THE PUBLIC UTILITY COMPANIES WILL BE NOTIFIED BY THE OWNER OF IMPENDING OPERATIONS. UPON AWARD OF CONTRACT, THE CONTRACTOR SHALL NOTIFY EACH UTILITY OF THE WORK SCHEDULE AND COORDINATE ACTIVITIES WITH THE UTILITY COMPANIES. ALL UNDERGROUND UTILITIES WITHIN THE WORK AREA SHALL BE SUITABLY MARKED BY THE UTILITIES COMPANIES. EXCAVATION AROUND AND WITHIN 2 FEET OF BURIED UTILITIES, ABOVEGROUND APPURTENANCES AND UTILITY POLES SHALL BE PERFORMED BY USE OF HAND TOOLS. PROVIDE SUITABLE PROTECTION FOR ALL UTILITIES. EXCAVATIONS DEEPER THAN 18 INCHES ADJACENT TO UTILITY POLES SHALL BE SLOPED AT 1:1 FROM THE EDGE OF THE POLE. NO MORE THAN 18 INCHES OF THE BURIED SECTION OF THE POLE SHALL BE UNEARTHED WITHOUT TEMPORARY SUPPORT AS APPROVED BY THE UTILITY.
7. REPLACED APPROXIMATELY 30 LF OF EXISTING STORM DRAIN WITH 42" RCP WEST OF EXISTING MANHOLE MH-2. INSTALLED APPROXIMATELY 20 LF OF NEW 42" RCP EAST OF EXISTING MANHOLE MH-2 TO MANHOLE SDMH-5 FOR A TOTAL OF APPROXIMATELY 50 LF OF NEW 42" RCP INSTALLED. REMOVED MANHOLE MH-2 AND APPROXIMATELY 13 LF OF EXISTING 42" RCP THAT RAN SOUTH FROM EXISTING MANHOLE MH-2 AND TRAVERSED THE SITE. PLACE DEBRIS AND SOIL IN FILL PLACEMENT CELL AND PLUG END OF PIPE WITH CONCRETE. SCOUR/CLEAN END OF PIPELINE AND COAT WITH EPOXY BONDING AGENT IMMEDIATELY PRIOR TO PLACING CONCRETE. CONCRETE SHALL EXTEND AT LEAST 8' INSIDE OF PIPELINE, 4' BEYOND THE END OF THE PIPELINE AND 2' ABOVE THE PIPELINE. BACKFILL WITH BORROW MATERIAL IN 12" COMPACTED LIFTS (90% PROCTOR).

GENERAL NOTES:

1. REFER TO DWG. 594000-10Z-02 FOR LEGEND AND ABBREVIATIONS.
2. REFER TO DWG. NO. 594000-30K-11, 13 AND 14 FOR STORM DRAINAGE, SECTIONS AND DETAILS AND DWG. NO. 594000-30K-01C FOR STORM DRAINAGE STRUCTURE SCHEDULE.



DRAWING KEY PLAN

0 40 80 FT.

STATE OF NEW YORK — DONALD TAYLOR — LICENSED PROFESSIONAL ENGINEER — 072924

6-23-98

REV.	DATE	REVISION DESCRIPTION	DES. CHK.	APPROVED
A	9/12/94	ISSUED FOR REVIEW AND COMMENT (STORM DRAINAGE)		
0	5/15/95	ISSUED FOR CONSTRUCTION (STORM DRAINAGE)		STG
1	9/8/95	FINAL ENGINEERING REPORT (DRAFT SUBMITTAL)		STG
2	12/21/95	ISSUED FOR BID		
3	2/5/96	ISSUED FOR CONSTRUCTION		

REV.	DATE	REVISION DESCRIPTION	DES. CHK.	APPROVED
5	9/13/97	ADDED STORM SEWER CB-8 W/TIE IN TO SDMH-5 AND 4" UDRAIN W/TIE IN TO CB-8		
6	3/09/98	STORM SEWER AS-BUILTS/ REMEDIAL ACTION REPORT (FINAL)		
7	5/13/98	STORM SEWER AS-BUILTS/ REMEDIAL ACTION REPORT (FINAL) W/ RESPONSES TO AGENCY COMMENTS		

DWG NO.	REFERENCE DRAWINGS

DWG NO.	REFERENCE DRAWINGS
594000-10Z-02	LEGEND AND ABBREVIATIONS

FLUOR DANIEL

NOTICE: THIS DRAWING HAS NOT BEEN PUBLISHED AND IS THE SOLE PROPERTY OF FLUOR DANIEL AND IS LENT TO THE RECIPIENT FOR THE CONFIDENTIAL USE ONLY AND IN CONSIDERATION OF THE LOAN OF THIS DRAWING, THE RECIPIENT ATTACHES AND AGREES TO RETURN IT UPON REQUEST AND AGREES THAT IT SHALL NOT BE REPRODUCED, COPIED, LENT OR DISCLOSED DIRECTLY OR INDIRECTLY, NOR USED FOR ANY PURPOSE OTHER THAN FOR WHICH IT IS FURNISHED.

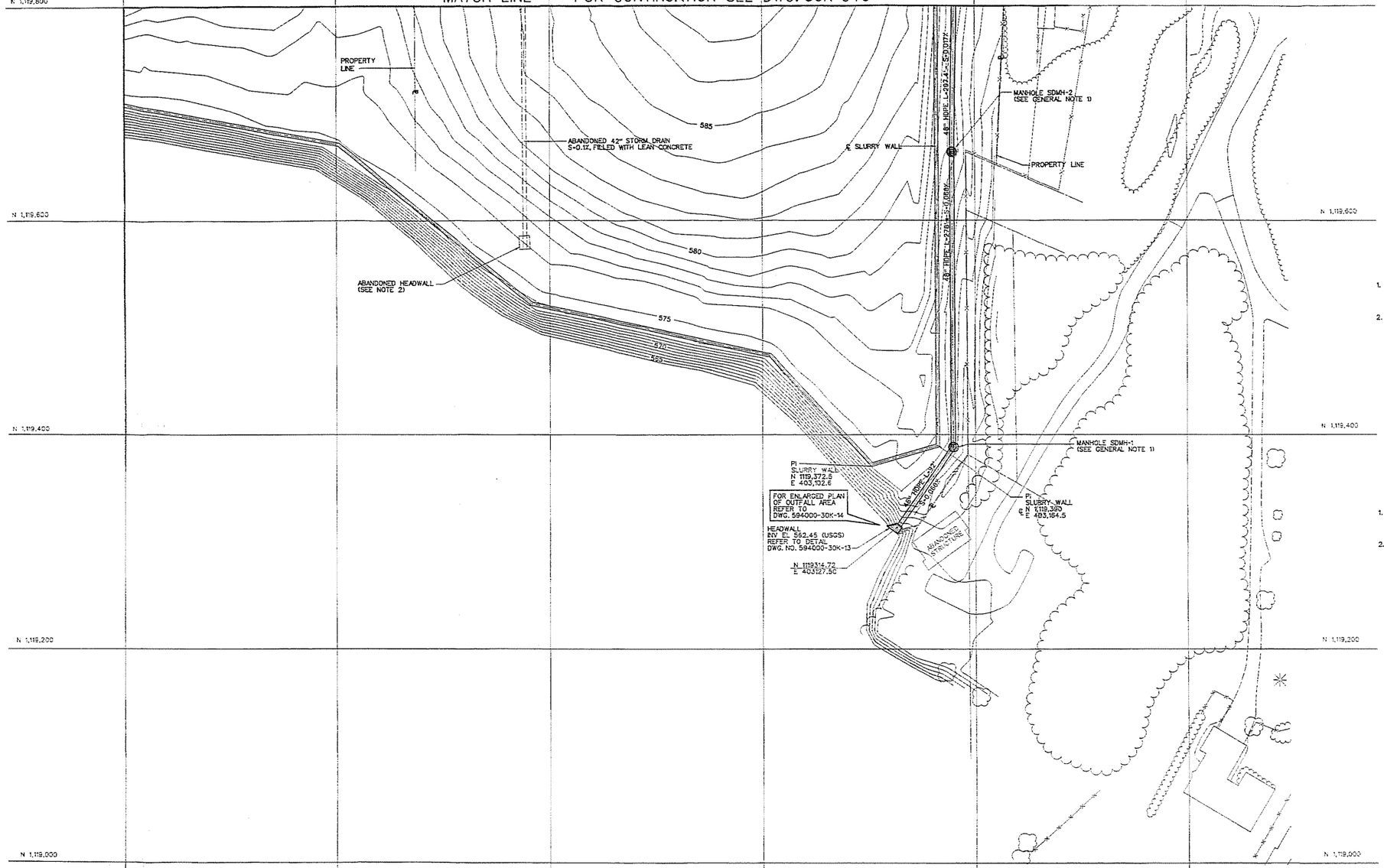
DESIGNED BY	BARBER/GERVAIS
DRAWN BY	J.GERVAIS
SUPERVISOR	RELEASE DATE
LEAD DRAUGHTSMAN	C.TAYLOR
PROJECT	R. MARCUCCIO
CLIENT	OXYCHEM/OLIN

OXYCHEM/OLIN
REMEDIAL DESIGN
102nd STREET LANDFILL SITE
NIAGARA FALLS, NEW YORK

SITE REMEDIATION PLAN AREA 3
STORM DRAINAGE

SCALE	DRAWING NUMBER	REV.
1"=40'	594000-30K-04C	7

MATCH LINE - FOR CONTINUATION SEE DWG. 30K-04C

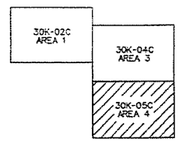


NOTES:

1. 48" DIA HDPE STORM DRAIN SHALL BE IN CONFORMANCE WITH ASTM F-894, SPIROLITE CLASS 40 OR APPROVED EQUAL. PIPE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
2. REMOVED EXISTING 42" CI FLAP GATE AND PLUGGED END OF PIPE WITH CONCRETE. SCOURED/CLEANED END OF PIPELINE AND COATED WITH EPOXY BONDING AGENT IMMEDIATELY PRIOR TO PLACING CONCRETE. CONCRETE EXTENDED AT LEAST 8" INSIDE OF PIPELINE, 4' BEYOND THE END OF THE PIPELINE AND 2' ABOVE THE PIPELINE. BACKFILLED WITH BORROW MATERIAL IN 12" COMPACTED LIFTS (90% PROCTOR). EXISTING 42" STORM DRAIN ABANDONED IN PLACE AND FILLED WITH GROUT.

GENERAL NOTES:

1. REFER TO DWG. NO. 594000-30K-11, 13 AND 14 FOR STORM DRAINAGE SECTIONS AND DETAILS AND DRWG. NO. 594000-30K-01C FOR STORM DRAINAGE STRUCTURE SCHEDULE.
2. REFER TO DWG. NO. 594000-10Z-02 FOR LEGEND AND ABBREVIATIONS.



DRAWING KEY PLAN

0 40 80 FT

REV.	DATE	REVISION DESCRIPTION	DES CHK	APPROVED
A	9/29/94	ISSUED FOR REVIEW AND APPROVAL (STORM DRAINAGE)		STG
0	2/28/95	ISSUED FOR CONSTRUCTION (STORM DRAINAGE)		
1	9/8/95	FINAL ENGINEERING REPORT (DRAFT SUBMITTAL)		
2	10/27/95	ISSUED FOR BIDS		
3	2/5/96	ISSUED FOR CONSTRUCTION		
4	5/7/96	REVISED SLURRY WALL LOCATION IN S.E. CORNER		
5	3/12/97	STORM SEWER AS-BUILTS		
6	7/24/97	STORM SEWER AS-BUILTS-REVISED OLIN SHORELINE		
7	3/25/98	STORM SEWER AS-BUILTS- REMEDIAL ACTION REPORT (FINAL)		
8	5/15/98	STORM SEWER AS-BUILTS REMEDIAL ACTION REPORT (FINAL) W/ RESPONSES TO AGENCY COMMENTS		

DWG.NO.	REFERENCE DRAWINGS

DWG.NO.	REFERENCE DRAWINGS
594000-10Z-02	LEGEND AND ABBREVIATIONS

FLUOR DANIEL

NOTICE: THIS DRAWING HAS NOT BEEN PUBLISHED AND IS THE SOLE PROPERTY OF FLUOR DANIEL AND IS LENT TO THE RECIPIENT FOR HIS CONFIDENTIAL USE ONLY AND IN CONSIDERATION OF THE LOAN OF THIS DRAWING THE RECIPIENT PROMISES AND AGREES TO RETURN IT UPON REQUEST AND AGREES THAT IT SHALL NOT BE REPRODUCED, COPIED, LENT OR OTHERWISE DISPOSED OF DIRECTLY OR INDIRECTLY NOR USED FOR ANY PURPOSE OTHER THAN FOR WHICH IT IS FURNISHED.

DESIGNED BY	BARBER/GERVAIS
DRAWN BY	J.GERVAIS
SUPERVISOR	J.GERVAIS
LEAD ENGR./CIEL	
PROJECT	R. MARGUCCIO
CLIENT	OXYCHEM/OLIN
RELEASE DATE	
DETAILS	
APP.DATE	
APP.DATE	

OXYCHEM/OLIN
REMEDIAL DESIGN
102nd STREET LANDFILL SITE
NIAGARA FALLS, NEW YORK

SITE REMEDIATION PLAN AREA 4
STORM DRAINAGE

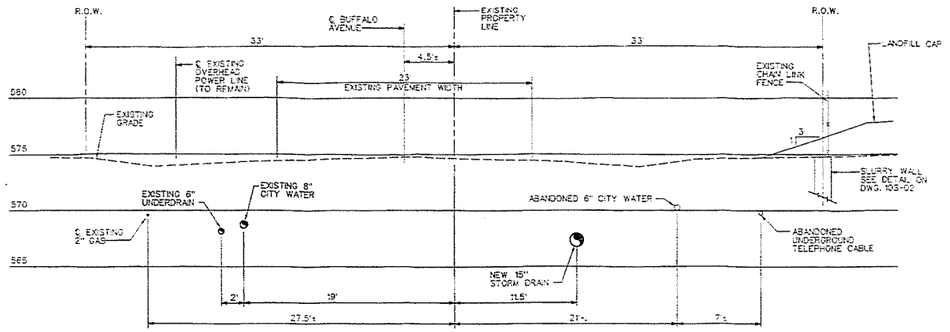
SCALE	DRAWING NUMBER	REV.
1"=40'	594000-30K-05C	8

REDUCED PRINT SCALES

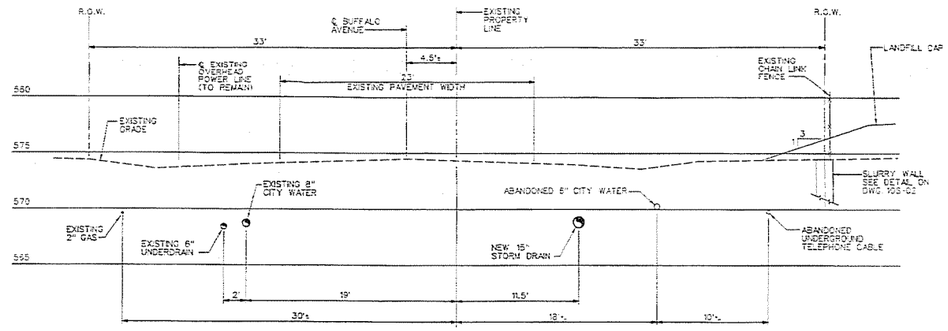
SUB-CONTRACT PKG.

WRK. PKG.

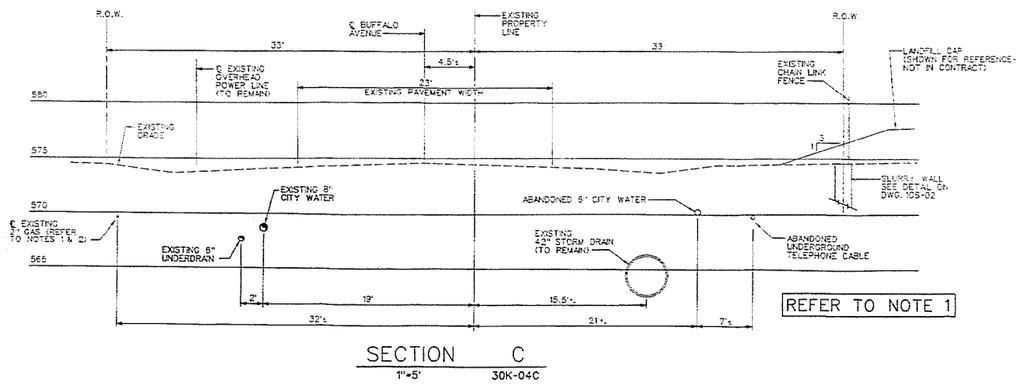
DIST. CODE



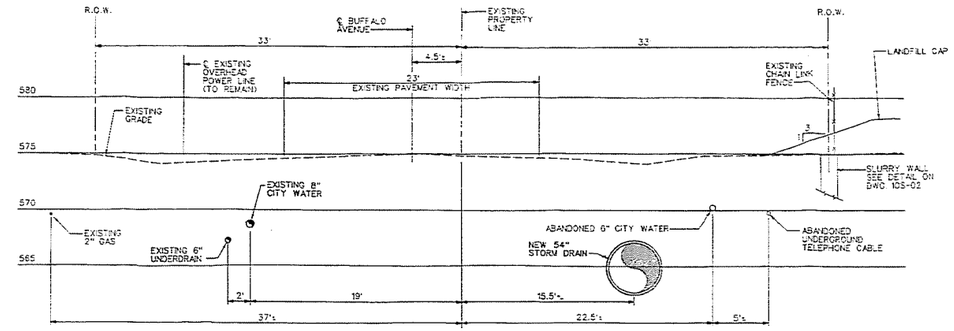
SECTION A
1"=5' 30K-02C



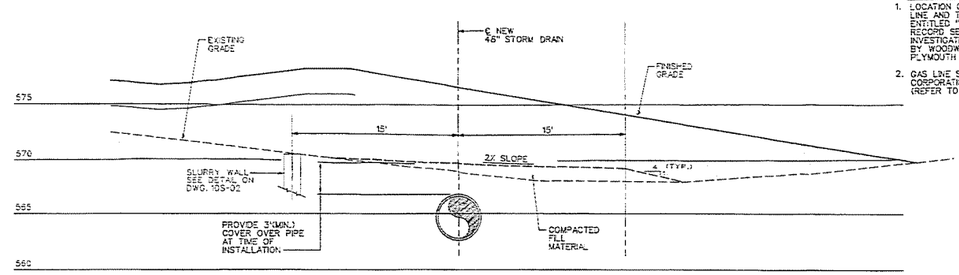
SECTION B
1"=5' 30K-02C



SECTION C
1"=5' 30K-04C



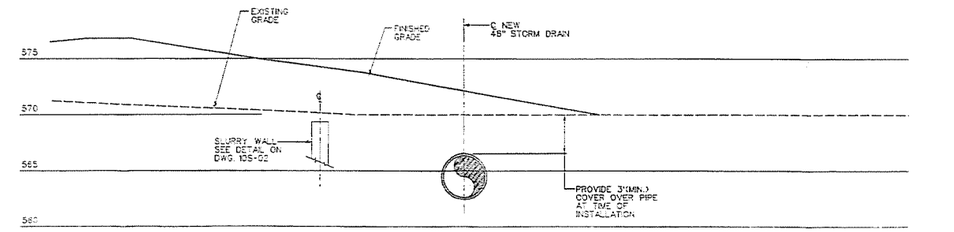
SECTION D
1"=5' 30K-04C



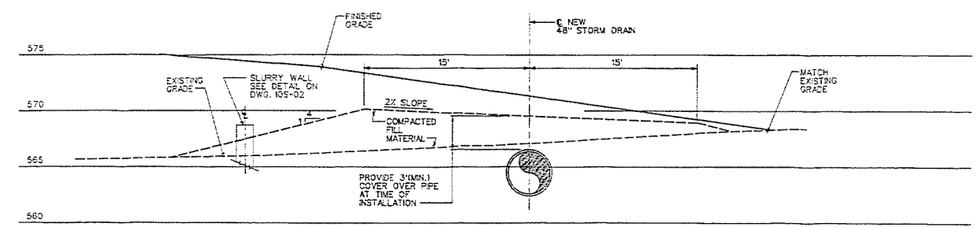
SECTION E
1"=5' 30K-05C

NOTES

1. LOCATION OF EXISTING STORM DRAIN, GAS LINE, WATER LINE AND TELEPHONE CABLE IS TAKEN FROM A REPORT ENTITLED "FINAL REPORT, UTILITIES INVESTIGATION/ RECORD SEARCH PHASE, 102nd STREET REMEDIAL INVESTIGATION, NIAGARA FALLS, NEW YORK", PREPARED BY WOODWARD-CLYDE CONSULTANTS, 5120, BUTLER PIKE, PLYMOUTH MEETING, PA 19462, DATED JULY 15, 1985.
2. GAS LINE SIZE ACCORDING TO NATIONAL FUEL GAS CORPORATION'S 2" SIZE INDICATED IN WCC REPORT (REFER TO NOTE 1 ABOVE) IS 8".



SECTION F
1"=5' 30K-05C



SECTION G
1"=5' 30K-05C

STATE OF NEW YORK — CHARLES TAYLOR — 072474 — PROFESSIONAL ENGINEER
6-23-98

REV.	DATE	REVISION DESCRIPTION	DES. CHK.	APPROVED
A	6/3/94	ISSUED FOR REVIEW AND COMMENT		
B	7/25/94	ISSUED FOR APPROVAL OUTLITY RELOCATION		
0	8/1/94	ISSUED FOR CONSTRUCTION (WATER LINE/UNDERDRAIN)		
1	9/23/94	ISSUED FOR REVIEW AND APPROVAL (STORM DRAINAGE)		
2	3/15/95	ISSUED FOR CONSTRUCTION (STORM DRAINAGE)		
3	9/8/95	FINAL ENGINEERING REPORT (DRAFT SUBMITTAL)		
4	12/29/95	ISSUED FOR BIDS		
5	12/29/96	ISSUED FOR CONSTRUCTION		
6	06/27/97	REVISED SLURRY WALL LOCATION & FINAL CONTOURS IN SECTION F & G		
7	12/5/97	STORM SEWER AS-BUILTS/REMEDIAL ACTION REPORT (FINAL) W/ RESPONSES TO AGENCY COMMENTS		

DWG.NO.	REFERENCE DRAWINGS	DWG.NO.	REFERENCE DRAWINGS

FLUOR DANIEL

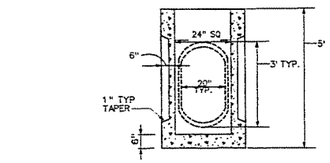
DESIGNED BY	BARBER/GERVAIS
DRAWN BY	J.GERVAIS
SUPERVISOR	A. J.GERVAIS
RELEASE DATE	
LEAD CHAIR/SPEC.	C. TAYLOR
DETAILS	
PROJECT	R. MARGUCCIO
APP'D DATE	
CLIENT	OXYCHEM/OLIN
APP'D DATE	

OXYCHEM/OLIN
REMEDIAL DESIGN
102nd STREET LANDFILL SITE
NIAGARA FALLS, NEW YORK

UTILITY RELOCATION
SECTIONS AND DETAILS

SCALE	DRAWING NUMBER	REV.
NOTED	594000-30K-11	7

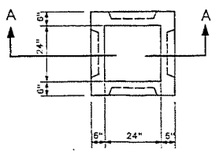
REDUCED PRINT SCALES
SUB/CONTRACT ENG.
WRK. ENG.
DIST. CODE



SECTION A-A

NOTE:
WALL THICKNESS AT KNOCKOUT TO BE 2" MINIMUM

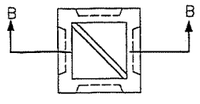
SPECIFICATIONS:
CONCRETE: 4,000 P.S.I. @ 28 DAYS
ENTRAINED AIR: 5%-9%
STEEL: A.S.T.M. A496-A615
DESIGN LOCATION: A.A.S.H.T.O. HS-20-44 WITH 30% IMPACT AND EQUIVALENT SOIL PRESSURE OF 130 (PSF). FLOATATION FORCES NOT ACCOUNTED FOR.
WEIGHT: 3,130 LBS



TOP VIEW

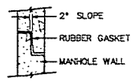
FRAME AND GRATE:
NEENAH R-4832B OR EQUAL
HS20-44, BICYCLE PROOF.
CODE: C8316B

SECTION B-B

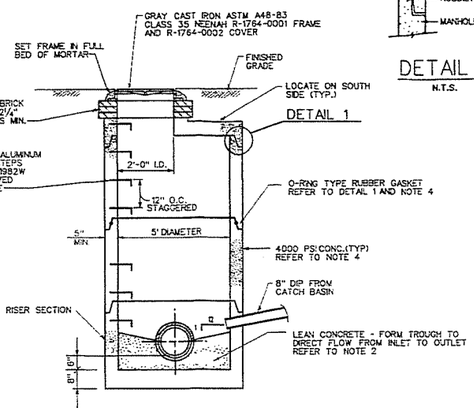


GRATE DETAIL

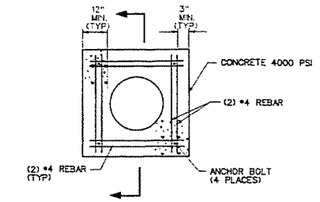
TYPICAL CATCHBASIN DETAIL
(PRECAST CONCRETE)
N.T.S.



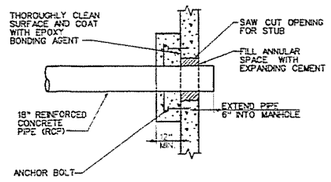
DETAIL 1
N.T.S.



TYPICAL MANHOLE DETAIL - SDMH-6 THRU 11
(PRECAST CONCRETE)
N.T.S.

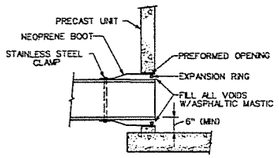


ELEVATION



SECTION

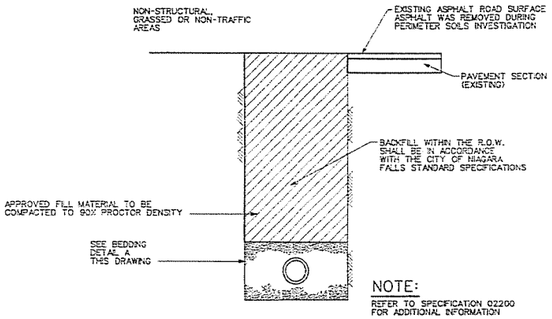
CONNECTION TO EXISTING MANHOLE - MH-3
N.T.S.



CONNECTION DETAIL
(PRECAST CONCRETE)
REINFORCED CONCRETE PIPE (RCP)
HIGH DENSITY POLYETHYLENE PIPE (HDPE)
N.T.S.

NOTES:

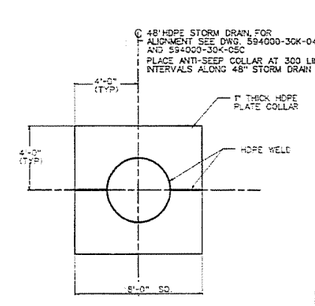
1. OPENINGS FOR PIPE IN PRECAST BASE AND RISER UNITS SHALL BE PREFORMED. THE CONTRACTOR SHALL FURNISH THE FABRICATOR WITH ANGLES BETWEEN CENTER LINES, THE INVERT ELEVATION AND THE SIZE OF ALL PIPES. HOLES SHALL BE TO A MAXIMUM OF 6" LARGER THAN THE OUTSIDE DIAMETEROF THE PIPE TO BE INSTALLED.
2. FORM TROUGH TO DIRECT FLOW FROM INLET(S) TO OUTLET FOR ALL PIPES. DEPTH OF TROUGH SHALL BE EQUAL ½ DIAMETER OF OUTLET PIPE.
3. REFER TO SITE REMEDIATION PLANS 594000-30K-01C FOR LOCATIONS, ELEVATIONS AND PIPE SIZES.
4. PRECAST REINFORCED CONCRETE RISER SECTIONS SHALL CONFORM TO ASTM C478. RUBBER GASKETS FOR JOINTS SHALL CONFORM TO ASTM C443.



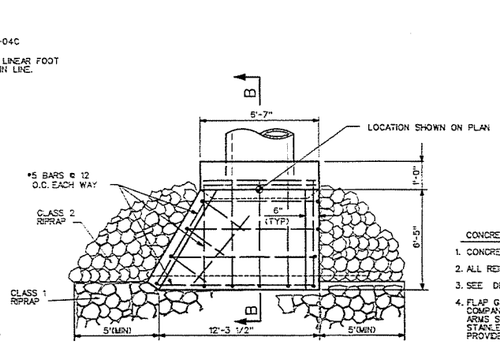
NOTE:
REFER TO SPECIFICATION 02200 FOR ADDITIONAL INFORMATION

(EXCAVATION/BACKFILL)

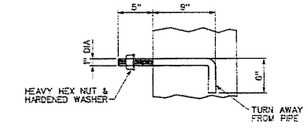
TYPICAL TRENCH DETAIL
N.T.S.



HDPE ANTI-SEEP COLLAR
N.T.S.



PLAN

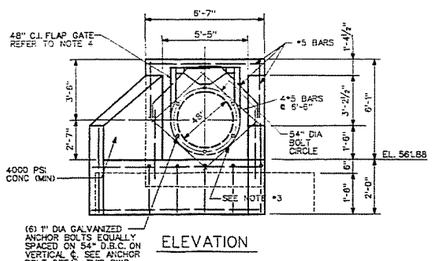


NOTE: CONTRACTOR TO VERIFY PROJECTION & LOCATION OF ANCHOR BOLTS FROM CERTIFIED VENDOR DWGS PRIOR TO PLACING CONCRETE.

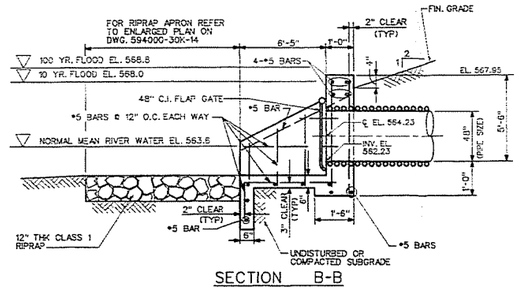
ANCHOR BOLT DETAIL
(FOR HEADWALL)

CONCRETE HEADWALL NOTES:

1. CONCRETE SHALL HAVE NOT LESS THAN 4000 PSI28-DAY COMPRESSIVE STRENGTH.
2. ALL REINFORCEMENT SHALL BE ASTM A615, GR60, SIZE #5 BARS
3. SEE DRAWING 594000-30K-05C FOR HEADWALL LOCATION.
4. FLAP GATE SHALL BE 48 INCH DIAMETER TYPE SF, MODEL #R-5050-SF48 BY NEENAH FOUNDRY COMPANY OR APPROVED EQUAL. FLAP GATE BODY SHALL BE CAST IRON ASTM A126-B. THE HINGE ARMS SHALL BE HIGH TENSILE BRONZE ASTM B584-CA865 AND HINGE PIN SHALL BE TYPE 304 STAINLESS STEEL. THE FLAP GATE SHALL BE MOUNTED TO CONCRETE WITH SIX 1" DIA ANCHOR BOLTS. PROVIDE NEOPRENE SEAT BETWEEN HEADWALL AND VALVE BODY.
5. PLACE 2"x2" KEY AT CONSTRUCTION JOINTS.

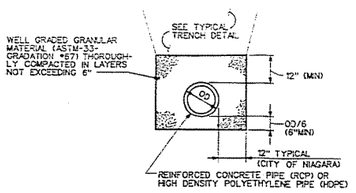


ELEVATION

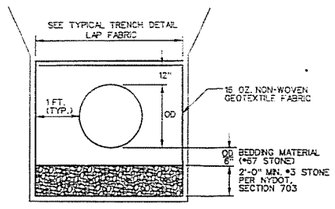


SECTION B-B

CONCRETE HEADWALL DETAIL
REFER TO ENLARGED PLAN ON DWG. 594000-30K-05C
N.T.S.



TYPICAL BEDDING DETAIL A
N.T.S.



TYPICAL BEDDING DETAIL FOR UNSTABLE SUBGRADE
N.T.S.

REV.	DATE	REVISION DESCRIPTION	DES. CHK.	APPROVED
A	9/29/94	ISSUED FOR REVIEW AND APPROVAL (STORM DRAINAGE)		JTG
0	3/15/95	ISSUED FOR CONSTRUCTION (STORM DRAINAGE)		JTG
1	9/8/95	FINAL ENGINEERING REPORT (DRAFT SUBMITTAL)		
2	12/13/95	ISSUED FOR BIDS		
3	2/5/96	ISSUED FOR CONSTRUCTION		
4	3/12/97	STORM SEWER AS-BUILTS		
5	8/13/97	ADDED STORM SEWER CATCH BASIN CB-8 TO DRAINAGE STRUCTURE SCHEDULE		
6	9/26/97	DRAINAGE STRUCTURE SCHEDULE REMOVED, NOTES & TYPICAL TRENCH DETAIL EDITED, & NEW CATCH BASIN DETAIL ADDED		
7	3/18/98	STORM SEWER AS-BUILTS- REMEDIAL ACTION REPORT (FINAL)		
8	6/15/98	STORM SEWER AS-BUILTS- REMEDIAL ACTION REPORT (FINAL) W/ RESPONSES TO AGENCY COMMENTS		

DWG.NO.	REFERENCE DRAWINGS	DWG.NO	REFERENCE DRAWINGS

FLUOR DANIEL

DESIGNED BY	BARBER/GERVAIS
CHECKED BY	J.GERVAIS
SUPERVISOR	J.GERVAIS
RELEASE DATE	
LEAD ENGR./PPC	C. TAYLOR
DETAILS	
PROJECT	R. MARGUCCIO
APPROVED	
CLIENT	OXYCHEM/OLIN
APP. DATE	

OXYCHEM/OLIN
REMEDIAL DESIGN
102nd STREET LANDFILL SITE
NIAGARA FALLS, NEW YORK

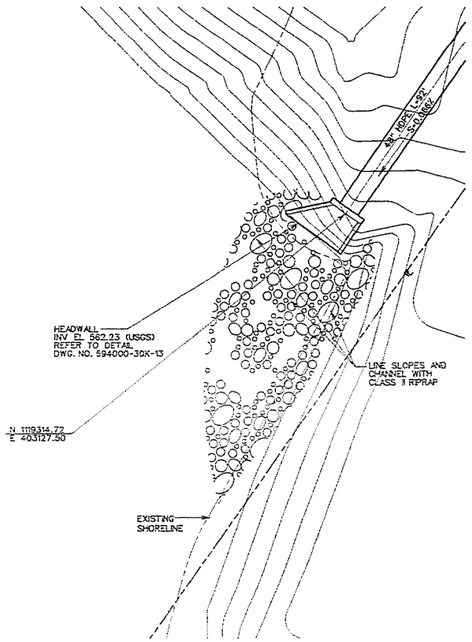
STORM DRAINAGE SECTIONS AND DETAILS

SCALE	DRAWING NUMBER	REV.
NOTED	594000-30K-13	8

MANUAL CHANGES MADE - YES ☐ NO ☐ | DWG. FILE UPDATED - YES ☐ NO ☐ | MODEL UPDATED - YES ☐ NO ☐ | CADD DRAWING No. 10230K13

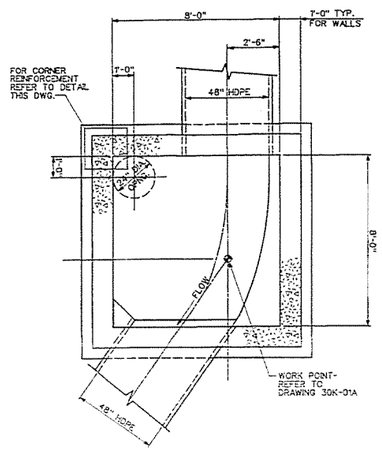
STATE OF NEW YORK — DONALD TAYLOR JR. — 071924 — LICENSED PROFESSIONAL ENGINEER
6-23-98

REDUCED PRINT SCALES



ENLARGED PLAN

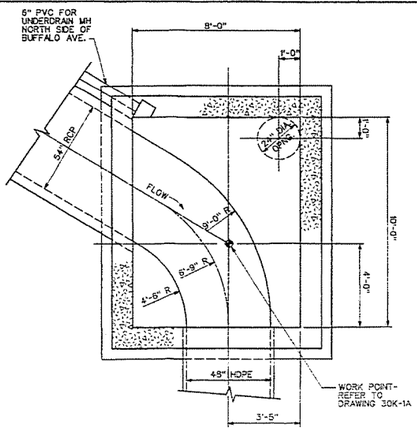
SCALE: 1"=10' 594000-30K-05C



PLAN - BASE SECTION

MANHOLE SDMH-1

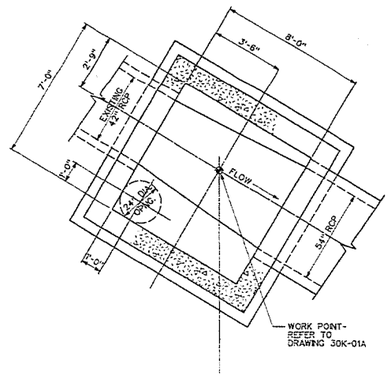
N.T.S.



PLAN - BASE SECTION

MANHOLE SDMH-3

N.T.S.



PLAN - BASE SECTION

MANHOLE SDMH-5

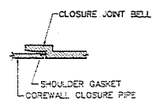
(SDMH-2 & 4 SIMILAR)

N.T.S.

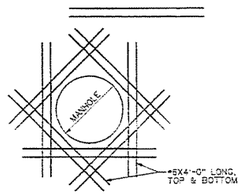
NOTE: MANHOLE SDMH-2 INLET AND OUTLET ARE 48" HDPE AND MANHOLE SDMH-4 INLET IS 54" HDPE AND OUTLET IS 48" HDPE.

NOTES

1. REINFORCING STEEL SHALL BE GRADE 60.
2. CONCRETE STRENGTH SHALL BE 4000 PSI AT 28 DAYS; MAXIMUM WATER/CEMENT RATIO SHALL BE 0.40.
3. PLACE CONCRETE IN ACCORDANCE WITH ACI 301-89.



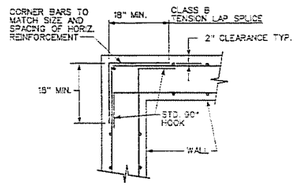
CLOSURE JOINT DETAIL



ADDITIONAL REINFORCMENT

AT MANHOLE OPENING DETAIL

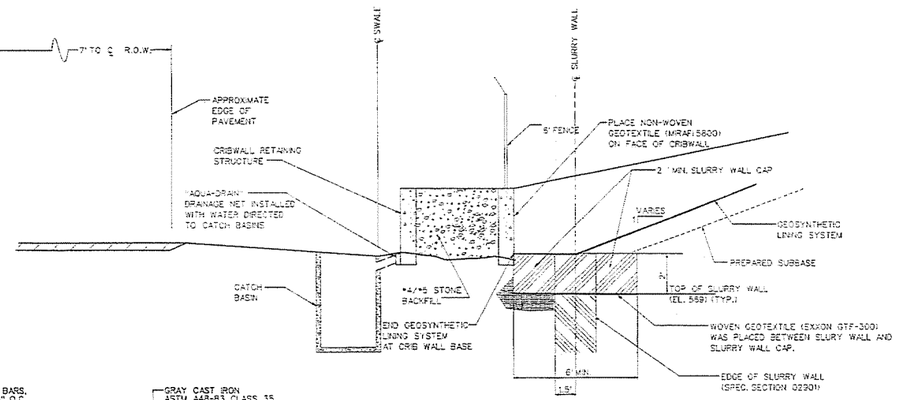
N.T.S.



CORNER REINFORCING DETAIL

PLAN VIEW

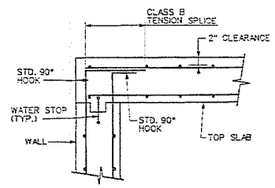
N.T.S.



TYPICAL LANDFILL/SLURRY WALL DETAIL

TOE AT BUFFALO AVENUE

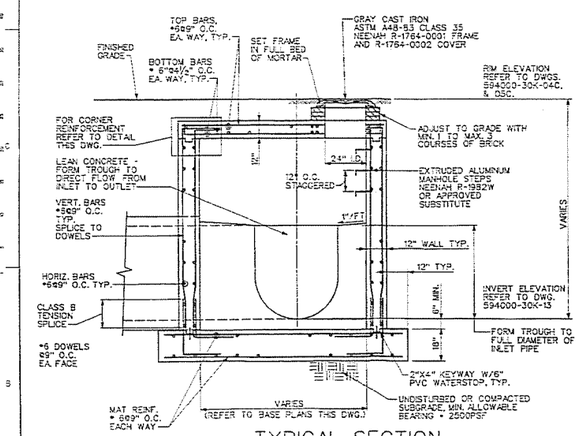
NTS



TOP CORNER REINFORCING DETAIL

ELEVATION VIEW

N.T.S.

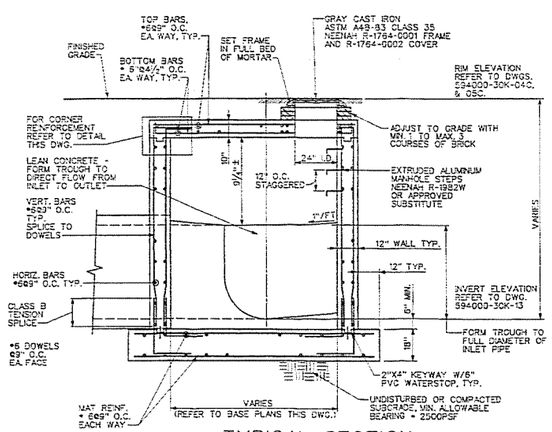


TYPICAL SECTION

MANHOLES SDMH-2 & 3

(PRECAST CONCRETE)

N.T.S.

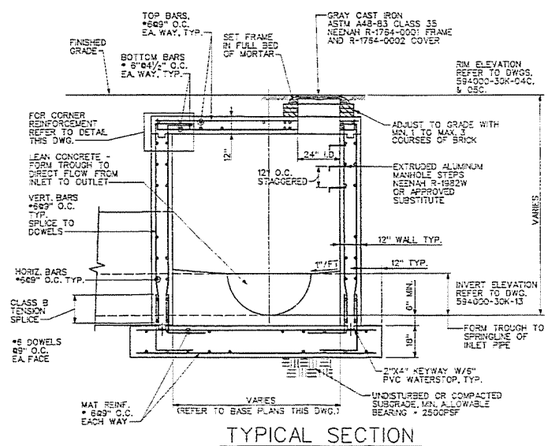


TYPICAL SECTION

MANHOLES SDMH-1

(PRECAST CONCRETE)

N.T.S.



TYPICAL SECTION

MANHOLES SDMH-4 & 5

(PRECAST CONCRETE)

N.T.S.

REV.	DATE	REVISION DESCRIPTION	DES. DWN.	APPROVED
A	9/8/95	FINAL ENGINEERING REPORT (DRAFT SUBMITTAL)		
0	12/19/95	ISSUED FOR BIDS		
1	2/5/96	ISSUED FOR CONSTRUCTION		
2	3/12/97	STORM SEWER AS-BUILTS		
3	5/8/97	STORM SEWER AS-BUILTS - REVISED OLIN SHORELINE		
4	12/15/97	VARIOUS TEXT EDITS		
5	1/29/98	STORM SEWER AS-BUILTS REMEDIAL ACTION REPORT (FINAL)		
6	6/25/98	STORM SEWER AS-BUILTS REMEDIAL ACTION REPORT (FINAL) W/ RESPONSES TO AGENCY COMMENTS		

DWG NO.	REFERENCE DRAWINGS	DWG NO.	REFERENCE DRAWINGS

FLUOR DANIEL

DESIGNED BY: BARBER/GERVAS
CHECKED BY: J.GERVAS
SUPERVISOR: J.GERVAS — RELEASE DATE
TECHNICIAN: C. TAYLOR — NOTES
PROJECT: R. MARGUCCIO — APP. DATE
CLIENT: OXYCHEM/OLIN — APP. DATE

OXYCHEM/OLIN
REMEDIAL DESIGN
102nd STREET LANDFILL SITE
NIAGARA FALLS, NEW YORK

STORM DRAIN
SECTIONS AND DETAILS

SCALE: NOTED — DRAWING NO.: 594000-30K-14 — REV: 6