ASTRO ELECTROPLATING, INC.

REMEDIAL DESIGN

170 Central Avenue
Farmingdale, New York

NYSDEC SITE CODE #1-52-036

N&P JOB NO. 96033

March, 2002
Revised September, 2003

ASTRO ELECTROPLATING, INC.

Remedial Design
170 Central Avenue
Farmingdale, New York

NP&V Job No. 96033

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This Remedial Design has been prepared in accordance with the Order on Consent Index #W1-0759-01-04, Astro electroplating Inc. (Site Code # 152036).

STATE OF NEW YORK ★ ARTHUR J. KOERBER ★ LICENSED PROFESSIONAL ENGINEER NO. 9/11/03

Engineers Seal

August, 2003
Date

ASTRO ELECTROPLATING, INC.

Remedial Design

170 Central Avenue
Farmingdale, New York

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DRAWINGS

1.0 REMEDIAL DESIGN PURPOSE AND CONTENTS

The purpose of this document is to present the Remedial Design which will implement the remedial alternative for Operational Unit-1 (OU-1) and the Interim Remedial Measure (IRM) for Operational Unit-2 (OU-2). OU-1 is comprised of the impacted soil portion associated with the former leaching area and OU-2 consists of groundwater resources impacted as a result of former subsurface discharges emanating from the facility. The Remedial Design will be presented in accordance with the Record of Decision (ROD) issued in March, 2001 and in compliance with the Order on Consent executed with the New York State Department of Environmental Conservation (NYSDEC) on January 7, 2002.

This document will contain a detailed description of the remedial objectives and the means by which each element of the selected remedial alternatives will be implemented to achieve those objectives. Also provided will be remedial design plans for each alternative, an implementation schedule, system operation and an effective monitoring program, contingency plans, a health and safety plan and a citizen participation plan.

The Remedial Design alternatives outlined under the Order on Consent include the following:

- Capping the remaining contaminated subsurface soils at the former leaching pool area utilizing a high-density polyethylene (HDPE) liner and an asphalt cover (OU-1).

- In order to prevent any spilled wastewater or other materials from infiltrating the factory floor, the factory floor shall be maintained such that the floor is free of cracks or holes. See **Appendix A** for proposed methods and product specifications.

- Institutional controls in the form of existing use and development restrictions limiting the use of groundwater as a potable or process water without necessary water quality treatment as determined by the Suffolk County Department of Health Services (SCDHS) from the affected areas.

- Deed restrictions to be recorded in the chain of title of the property to restrict the future use of the site for industrial use only, mandate the maintenance of the asphalt cap and require notification to the NYSDEC when excavation of the capped area or beneath the building floor is planned.

- Initiation of the groundwater IRM which will involve the installation of an extraction well which will transfer contaminated groundwater to the facilities existing retrofitted wastewater treatment system.

2.0 REMEDIAL OBJECTIVES AND IMPLEMENTATION

2.1 Implementation and Design

2.1.1 Capping of Former Leaching Pool Area (OU-1)

Under this selected remedy the impacted soils still present in the area of the former leaching pools will be isolated from infiltrating fluids (i.e., stormwater) through the use of an impermeable cover. The proposed cover will consist of a high density polyethylene (HDPE) liner covered with an asphalt cap. The existing asphalt presently overlying the former leaching pools will be removed and a 1 to 2 foot wide by 2 (feet) ft deep trench will be excavated along the north, east and southern extent of the intended cap area. In addition, approximately 6 inches of the soil immediately underlying the asphalt will be removed to accommodate the liner. The HDPE liner will be placed atop the horizontal extent of the excavation and overlapping vertically into the 2 ft trench. Once installed, the trenches will be backfilled with clean soil and the overall area will then be covered with an asphalt cap to meet the existing adjacent pavement. The asphalt will maintain a pitch of approximately 1% towards the east to promote run off away from the leaching pool area and the building. The cap will be designed to cover the entire leaching pool area with dimensions of 37 ft wide by 124 ft long in a north-south orientation. The design plans for this remedy are provided in a folder at the back of this document. Implementation of this alternative will require use of an excavator for trench and cap construction as well as staging areas for materials. Overall, the use of this alternative may significantly reduce release rates of contamination within the soils underlying the former leaching pool area. Implementation of this remedy will not remove impacted soils but will control further migration of subsurface contamination. In addition, excavation of the area between the building and former drywells will be excavated to determine if any former piping facilities between the facility and the former drywells remain. If evidence of these structures are discovered to be present, they will be removed and any connection to the facility building will be appropriately abandoned in accordance with NYSDEC requirements.

In addition, the following restrictions, controls and maintenance activities will be instituted to further mitigate threats to the public and/or the environment resulting from the Astro Electroplating site.

- In order to prevent any spilled wastewater or other materials from infiltrating the factory floor, the factory floor shall be maintained such that the floor is free of cracks or holes. See **Appendix A** for proposed methods and product specifications.

- Institutional controls in the form of existing use and development restrictions limiting the use of groundwater as a potable or process water without necessary water quality treatment as determined by the Suffolk County Department of Health Services (SCDHS) from the affected areas.

- Deed restrictions to be recorded in the chain of title of the property to restrict the future use of the site for industrial use only, mandate the maintenance of the asphalt cap and require notification to the NYSDEC when excavation beneath the floor area is planned.

2.1.2 Groundwater IRM (OU-2)

The purpose of this groundwater IRM will be to treat the most contaminated portion of the groundwater contaminant plume underlying the site until a comprehensive groundwater investigation is completed for OU-2. Under this IRM remedy the existing wastewater treatment system will be used for treatment of groundwater impacted by the inorganic plume. Currently, the system is utilized for treating facility process wastewater at a rate of 30 gallons per minute (gpm). For the purpose of this IRM, the system will be retrofitted to accommodate a flow of 40 gpm allowing the system to treat contaminated water at a rate of 10 gpm. The system will operate approximately 12 to 14 hours per day five days a week.

One, six (6) inch extraction well to be identified as EX-1, will be sited southeast of the subject site (see IRM design plans included in the rear of this document). The extraction well will be installed to a depth of approximately sixty (60) feet below ground surface (bgs). The well will be constructed of thirty (30) linear feet of slotted (0.020 inch) schedule 40 PVC screen and approximately thirty (30) linear feet of schedule 40 PVC riser. The base of the borehole and annular space around the well from its base to a point one foot above the highest screen section will be packed with clean filtration media (Morie sand). A two (2) foot bentonite seal will be packed around the casing above the filtration media. Bentonite grout will be placed above the bentonite seal to a point approximately three feet below elevation grade. A below grade concrete service box with a cast iron manhole and access cover will be used to house the extraction well and the necessary manifold and piping. A Jacuzzi submersible pump will be installed to capture the groundwater from the extraction well and transfer it to the retrofitted wastewater treatment system. The pump will be rated for up to 10 gallons per minute @ 75 feet TDH, three phase.

The extraction well pump will be integrated into the existing wastewater treatment system using a series of floats to control pump on and pump off. These floats will be installed in the existing influent wastewater holding tank.

The pumps will be protected from running dry through the installation of a pressure transducer in the pipeline. The pressure transducer will register a change in pipe pressure, due to the movement of water within the pipeline. The control panel will contain logic such that if in the event that the pump is called to run and a pressure increase isn't observed in a specified period of time that the pump will automatically shutdown and provide an alarm signal indicating a problem. The control panel will also be configured such that in the event that the pump is running and that a pressure decrease to zero is observed for a specified period of time, that the panel will shut off the pump and display an alarm signal.

An integrated timer will be installed in the control panel to allow the operator to set the time periods for which the extraction well pump can run. Currently it is planned that the pump is to run during facility off periods. The use of this timer will minimize the use of

the extraction well water to dilute the existing industrial wastewater being generated by the facility.

A flow meter will also be installed in the control panel to provide a record of flow pumped to the treatment system.

The existing on-site system consists of an acidification/flocculation unit designed to accommodate 35 gpm of total flow. The system operates at 30 gpm and would therefore will be retrofitted to receive an additional 5 gpm. All treated groundwater will be discharged to the municipal sewer system subject to a permit amendment from the Suffolk County Department of Public Works (SCDPW).

2.2 Remedial Objectives

The objectives of the remedial program have been established through the remedy selection process stated in 6 NYCCR Part 375-1.10. The overall remedial goal is to meet the Standards, Criteria and Guidance (SCGs) presented in the Remedial Investigation/Feasibility Study for the subject site as well as to be protective of human health and the environment. The objective of the selected remedies are to provide acceptable options that results in reduction in toxicity, mobility and volume of the hazardous wastes of concern that are present in the soils and groundwater underlying and downgradient of the site.

The remediation objectives for the subject site as established under the ROD include:

- Reduce or control the metal contamination at the site;
- Eliminate or reduce the potential for leaching of metals to the aquifer; and
- Contain, control and direct process water to prevent migration of contamination to the subsurface soil and groundwater.

The remedy selected for OU-1 will result in the capping of the leaching pool area to prevent the further migration of soil contamination to the underlying groundwater resources. As a result, no subsurface soils will be removed as part of the implementation of this remedy. While it will not reduce the concentration or quantity of contamination in the area of the former leaching pools, it has been designed to limit the potential for the leaching of metals into the aquifer.

The remedy for OU-2 will result in the extraction and treatment of impacted groundwater emanating from the site. The purpose of this remedial alternative is to provide a temporary measure to control the further downgradient migration of impacted groundwater as well as to provide a degree of remediation of groundwater resources underlying the site until a comprehensive groundwater investigation is completed under OU-2. Following this investigation it will be determined whether continuation, further enhancements or expansion of the IRM will be required.

3.0 REMEDIAL DESIGN OPERATION, MAINTENANCE AND MONITORING

Design and implementation of the selected remedies or IRMs for OU-1 and OU-2 will require certain operational, maintenance and monitoring parameters to ensure the proper operation and effectiveness of each alternative to achieve the remedial objectives established for the site. These will include periodic remedial facility inspection and maintenance as well as groundwater monitoring. In order to ensure that the construction activities for the Astro Electroplating project are preformed in accordance with the best industry practices and in conformance with various local, State and Federal rules and regulations a Quality Assurance/Quality Control Plan has been prepared and provided as **Appendix B**.

3.1 Remedial Design Operation and Maintenance

3.1.1 Capping of Former Leaching Pool Area (OU-1)

Following installation, annual inspection of the cap will be required to ensure the effectiveness and integrity of this remedial measure. The cap will be inspected yearly for the presence of damage including cracks, broken asphalt or ponding of surface runoff. The cap itself will be replaced every 10 years for as long as the associated contaminated soils remain present in the Former Leaching Pool Area. This remedial alternative will be discontinued following NYSDEC approval should the contaminated soils be removed or remediated through active or natural attenuation processes. The criteria for determining the discontinuation of this remedy will be based on the State Standards, Criteria and Guidelines (SCGs) established for New York State. These include the methods and guidelines for determining the appropriate extent and removal, remedy and other measures in order to attain or exceed applicable or relevant and appropriate federal health and environmental laws.

A listing of SCGs Index and their governing agencies which are considered acceptable or appropriate for discontinuing the use of the cap at the Astro Electroplating, Inc. facility are presented in **Appendix C**.

Target cleanup goals also have been established for each contaminant of concern for soil and will correspond to the recommended soil cleanup objectives established in TAGM 4046 for each inorganic constituent of concern (which include Nickel, Chromium, Copper and Zinc).

In addition, the following restrictions, controls and maintenance activities will be instituted to further mitigate threats to the public and/or the environment resulting from the Astro Electroplating site.

- In order to prevent any stormwater from infiltrating the asphalt cap it shall be maintained such that it is free of cracks or holes. Should significant wear in the form of degradation of the asphalt surface, cracks, etc. be observed these areas will be resurfaced consistent with the design criteria established in Section 2.1.1 and the

Plans provided. These criteria may consist of asphalt and/or liner patching, tar sealing or if necessary cap replacement.

- Institutional controls in the form of existing use and development restrictions limiting the use of groundwater as a potable or process water without necessary water quality treatment as determined by the Suffolk County Department of Health Services (SCDHS) from the affected areas.

- Deed restrictions to be recorded in the chain of title of the property to restrict the future use of the site for industrial use only, mandate the maintenance of the asphalt cap and require notification to the NYSDEC when excavation of the capped area or beneath the building floor is planned.

It should be noted that restrictions, controls will be discontinued following NYSDEC approval should the contaminated soils be removed or remediated through active or natural attenuation processes.

3.1.2 Groundwater IRM (OU-2)

Following installation of the extraction well and retrofitting of the treatment unit, periodic maintenance and monitoring will be required to ensure the effectiveness and operational efficiency of the system. Astro Electroplating Inc. maintains personnel on staff responsible for the operation and maintenance of the existing treatment facility. Following startup, the system will be inspected daily for the period of one week to identify any immediate problems (i.e., leaks, improper flow rates, etc.) which may be present. Following this period the system will be monitored on a quarterly basis. The system will be inspected weekly for any mechanical problems and influent/effluent samples will be collected to monitor system efficiency and effectiveness at treating impacted groundwater. Influent/effluent sampling will be conducted weekly during the first month of operation, monthly during the following three months and then quarterly for the remainder of the systems operation. The system will remain in operation until a comprehensive groundwater investigation regarding the extent of the plume is conducted and a more appropriate and permanent remedial alternative can be implemented.

3.2 Environmental Monitoring

To evaluate the effectiveness of the IRM quarterly groundwater monitoring will be conducted utilizing the existing on-site monitoring wells. All samples will be collected utilizing low flow groundwater sampling techniques to minimize the presence of suspended solids and minimize sample turbidity. All groundwater sampling protocols will be conducted in accordance with the methodology outlined in Section 6.9 of the RI/FS Work Plan. All sample identification, documentation and shipping procedures will comply with the methods outlined in Section 6.12 of the RI/FS Work Plan.

The samples collected will be analyzed for Nickel, Copper, Chromium and Zinc and will comply with the Quality Assurance and Quality Control parameters established in Section 3.0 of the RI/FS Work Plan. The analysis of each sample will be conducted by a NYSDOH ELAP CLP certified laboratory with Category B deliverables.

The analytical results will be compared with the regulatory standards established in TAGM 4046 and results obtained during previous sampling activities.

With regard to environmental monitoring related to soils underlying the cap, periodic sampling and monitoring of impacted soils is neither practical or feasible. However, groundwater analytical results obtained from monitoring wells in the vicinity of the Former Leaching Pool Area (MW-2 and MW-3) can be evaluated against applicable groundwater standards and previous sample results to determine if there is a decrease in contaminant levels in groundwater downgradient of the capped source. These results will then be assessed to determine if the cap is functioning effectively as a remedial measure.

All maintenance and environmental monitoring will be summarized in a quarterly report and submitted the NYSDEC.

4.0 CONTINGENCY PLAN

In the event that the Remedial Design outlined within the ROD fails to achieve any of its objectives or otherwise fails to protect human health and the environment, a contingency plan will be implemented.

4.1 Capping of Former Leaching Pool Area (OU-1)

Should it be demonstrated that the cap is not effectively achieving the objectives of its design it may be necessary to initiate alternative or additional measures to prevent migration of soil contamination to the underlying groundwater resources. Since it is impossible to determine the potential circumstances requiring the need for a contingency plan it is proposed that several options be considered based on a review of the conditions resulting in the remedy not achieving its goals. Options which may potentially be considered have been previously presented in the RI/FS and consist of excavation as well as no additional action. In addition, enhancement of the cap may be appropriate to ensure compliance with the Remedial Design objectives. To determine the best course of action, an analysis of the system failure will be conducted and the results discussed with NYSDEC personnel to determine a contingency proposal best suited to achieve the objectives established in Section 2.2.

Since the restrictions, controls and maintenance activities are primarily preventive measures no contingency plans related to these are proposed.

4.2 Groundwater IRM (OU-2)

The intent of the groundwater IRM established in the ROD is to provide a remedial alternative for the treatment of contaminated groundwater emanating from the site until a comprehensive groundwater investigation is completed for OU-2. At this time the IRM is not intended to be the final alternative established for the remediation of contaminated groundwater but as a temporary measure to control the further migration and provide a degree of remediation of the contaminant plume. However, based on results from future investigative activities it may be determined that the IRM adequately achieves the objectives established in Section 2.2. In any event, due to the temporary operation of this IRM a contingency is not considered to be necessary at this time and may be more adequately evaluated when a permanent alternative is selected.

5.0 HEALTH AND SAFETY PLAN

A Health and Safety Plan for Remedial Design activities has been prepared for the protection of persons at and in the vicinity of the site during construction and after the completion of construction. This plan has been prepared in accordance with 29 CFR 1910 and is presented in **Appendix D**.

6.0 CITIZEN PARTICIPATION PLAN

A Citizen Participation Plan which incorporates the appropriate activities outlined in the NYSDEC's publication, "Citizen Participation in New York's Hazardous Waste Site Remediation Program: A Guidebook", dated June 1998 and 6 NYCRR Part 375 has been prepared for Remedial Design activities. The Plan is included as **Appendix *E***.

7.0 SCHEDULE

The initiation of Remedial Design construction activities will be dependent on approval of the Remedial Design Plan by the NYSDEC. For the purpose of this document it is anticipated that approval will be granted approximately three months from the initial submission of the Remedial Design Plan and activities would begin following a ten working day notification of the NYSDEC prior to the initiation of any activities. The sequence of activities will be as follows:

- Send design specifications out to contractors for bid (1 week).
- Receive all bid proposals from solicited contractors (3 weeks).
- Select contractor for construction of each phase of Remedial Design construction (4 weeks).
- Mobilize contractor to begin construction of cap (2 weeks).
- Complete cap and mobilize contractor for installation of extraction well and ancillary piping facilities (4 weeks).
- Complete extraction well construction and installation of piping facilities (4 weeks).
- Submission and approval of final Remedial Design Report (8 weeks).

The retrofitting of the existing water treatment system is dependent on Suffolk County Department of Public Works (SCDPW) approval which is pending. Once this approval is granted then connection to the extraction well can proceed and the groundwater IRM can be fully initiated. It is anticipated that retrofitting of the system should take approximately 4 months following which the final connections can be completed and the system activated. As per the Order on Consent within 30 days after the completion of construction activities identified in the NYSDEC approved Remedial Design, a post-remedial operation and maintenance plan (O&M Plan), as-built drawings, a final engineering report, and a completion/implementation certification will be submitted to the NYSDEC and any other designated agencies.

Finally, the restrictions, controls and maintenance activities presented in the ROD will be implemented during the course of the construction activities presented above.

APPENDICES

APPENDIX A

FLOOR SEALING METHODS AND SPECIFICATIONS

FACILITY FLOOR SEALING METHODS AND MAINTENANCE

Should the Astro Electroplating facility floor demonstrate excessive wear or the presence of significant crack and/or holes it will be repaired and treated to prevent any spilled wastewater or other materials from seeping to the subsurface.

Any cracks and holes will be filled using a two part epoxy sealant and which will be allowed sufficient time to cure prior to application of a two part, water based epoxy floor covering. The description of and specifications for a product presently being considered for application to the facility floor is provided as an attachment.

ATTACHMENT

FOSROC®

NITOFLOR FC 130E

Water dispersed epoxy floor coating and sealer

USES

NITOFLOR FC 130E provides a pigmented sealing coat onto cementitious or asphalt floors which is outdoor, easily cleaned and resistant to penetration of oils and liquids. Suitable for use in warehouses, garages, light industrial areas, food processing areas, kitchens, and other areas of pedestrian and light vehicular traffic.

ADVANTAGES

- **Attractive** - available in a range of colors
- **Hard Wearing** - low maintenance costs
- **Chemical Resistant** -improves the resistance of concrete to many industrial chemicals
- **Hygienic** - easily cleaned due to impervious finish
- **Economic and easy to apply**
- **Solvent Free** - can be applied in confined spaces
- **Odor Free** - can be applied in food processing areas
- **Water Based** - all tools and equipment can be cleaned with water
- **Can be applied to asphalt surfaces**

DESCRIPTION

NITOFLOR FC 130E is a two component water based epoxy resin system supplied in pre-measured kits ready for on site mixing and use.

The cured film forms a hard, flexible, semi gloss coating to concrete and other substrates

Colors

NITOFLOR FC 130E is available in clear and a variety of colors. See FOSROC color chart for specific colors.

Custom colors are available in a minimum of 100 gallons. Consult FOSROC Technical Sales Representative for additional information.

Odorless, water based epoxy resin formulation allows use in those environments where solvent based systems would not be allowed, eg. food processing areas, confined and poorly ventilated areas, etc.

PROPERTIES

	At 68°F	At 85°F
Pot Life*	2 hrs.	1 hr.
Time between coats	Within 24 hrs.	Within 16 hrs.
Initial Hardness	24 hrs.	16 hrs.
Full Cure	7 days	7 days

Please note that after the pot life has expired, the material, although not hardened, increases in viscosity and the characteristics of the product change. Excess material should be discarded after this point.

Temperature Limitations

Minimum application temperature is 45°F.

Chemical Resistance

Samples of NITOFLOR FC 130E have been subject to constant immersion at 68°F for 3 months in the following chemicals and have been found to be unaffected:

Skydrol
Dilute Sodium Hydroxide
Dilute Sulphuric Acid
Oil and Grease
Gasoline
Ammonia 10% Solution
Urea 10% Solution
Saturated Sugar Solution

Good housekeeping is essential in areas where chemical spillage is likely to occur. It is especially important that such spillage should not be allowed to dry as much higher concentrations of chemicals become involved

Where chemicals at higher temperatures are involved consult you local FOSROC Technical Department

INSTRUCTIONS FOR USE

Surface Preparation

Providing the concrete substrate is sound, of sufficient strength and free of major defects, the surface of both old and new concrete should be prepared by one of the following methods. Method 1 is more effective than 2 and 2 is more effective than 3.

1. Etch surface by mechanical scarification to needed profile as determined by initial substrate conditions and the contractors evaluation, then remove dust by vacuum cleaner.

2. Sandblast all surfaces to be bonded, then remove dust by vacuum cleaner.

3. Etch with 10-12% hydrochloric acid until bubbling subsides (about 15 minutes). Wash with clean water by high-pressure hose until all slush is removed. Final rinsing with a 1% ammonia solution followed by a clean water wash is recommended.

Regardless of what method of preparation is used, before coating is applied the surfaces to be treated must be clean and completely free of oil, grease, other coatings and any other contamination.

Asphalt surfaces should not be coated if under 3 months old since the asphalt will release volatile vapors which may blister the paint film. The asphalt should be scrubbed with a detergent solution and allowed to dry before application of NITOFLOR FC 130E.

Mixing

The individual components of NITOFLOR FC 130E should be thoroughly stirred before the two are mixed together. The entire contents of the smaller base container should be poured into the larger hardener can and the two materials mixed thoroughly for at least 3 minutes. The use of a heavy duty slow speed drill and paddle is desirable.

Coating

Apply the mixed NITOFLOR FC 130E to the clean, prepared surface, using a brush or lamboswool roller. Make certain that the area is completely coated and that "ponding" of the material does not occur as water may be trapped and the material will not cure completely.

The second coat may be applied as soon as the first coat has initially dried. The time will depend on the type of surface and ambient conditions but will be in the range of 2-6 hours. Overcoating should be carried out within 24 hours at 68°F and 16 hours at 95°F.

Non Slip Finish

Add 2 lbs. of finely textured, dry, clean sand to each gallon of mixed material.

Ensure even dispersion of the aggregate by mixing with a slow speed drill and mixing paddle for 2 minutes. Apply as described above.

LIMITATIONS

Storage

Material should be stored at temperatures between +40°F and 95°F.

Shelf Life

12 months in unopened containers.

PACKAGING & COVERAGE

NITOFLOR FC 130E is supplied in 1 gallon and 4 gallon kits.

The coverage of NITOFLOR FC 130E depends to a large extent on the substrate and site conditions.

When stored, mixed and applied at temperatures above 60°F onto sound, clean concrete the following coverage rates should be achieved:

1st coat	200 sq. ft. per gal.
2nd coat	300 sq. ft. per gal.

OHM shield
Static Dissipative Products

CE-5800 EPOXY FLOOR COATING

Description

The Ohm-Shield™ CE-5800 is a two part, water based epoxy floor coating formulated to provide static dissipative, high abrasion resistance and high adhesion protection. CE-5800 is ideal for vinyl flooring, concrete and metals.

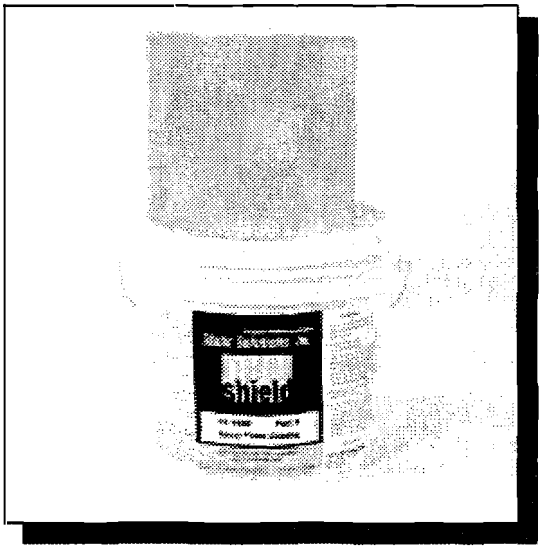
With consistent readings in the 10^6-10^8 ohms range, regardless of relative humidity, CE-5800 is an effective and fast path to ground system. CE-5800 may be used with ESD shoes or heelgrounders. When applied to work area floors, CE-5800 eliminates cumbersome floor mats.

Stocked in beige and light grey, other colors are available with a 25 gallon minimum.

Warm water will remove dirt and debris from cured CE-5800 floor coating without compromising the electrical integrity of the floor.

Application

Ohm-Shield™ CE-5800 is used in areas where a dissipative surface is needed for the grounding of static charges, especially on metals, vinyl tiles and concrete. Other industries which use CE-5800 include electronic manufacturing, cleanroom, pharmaceutical, medical, automotive, plastics, munitions, and avionics.



- High adhesion to metals, vinyl, concrete
- Available in customized colors
- Resistant to temperature and chemicals
- High abrasion resistance
- Zero tribogeneration
- Meets all EOS/ESD specifications
- Non flammable, waterbased
- Primer available to apply to porous and difficult to bond surfaces

Static Solutions, Inc.

For Ultimate Protection

Guarantee a properly grounded floor

- Ohm-Stat™ RT-1000: resistivity tester
- Now three meters in one! RT-1000 tests resistance, ESD seating, and garments.
- Measures humidity and temperature

Humidity and temperature affect resistivity so they must be tested. The Ohm-Stat™ RT-1000 tests resistivity, humidity and temperature of all conductive, antistatic and static dissipative surfaces for electrical resistivity/resistance according to the EOS/ESD CECC, ANSI, ASTM, UL, NFPA, Military, and EIA test procedures.

Major Specifications

Polymer:	2 part water based epoxy/non hazardous
Appearance	Beige/colors available with 25 gallon minimum
pH	8-9
Solids	Weight: 48.8% Volume: 29.05%
Coverage	300-500 sq. ft. per gallon/mil (depending on surface)
VOC	2.66 lbs./gal (minus water) 97 lbs./gal (as applied)
RTT	10^5-10^8 ohms (EOS/ESD-S 4.1)
RTG	10^5-10^8 ohms (EOS/ESD-S 4.1)
Charge Generation	Zero per AATCC 134-179
Gloss	20@60°
Reduction	Mix 4:1 part A to B by volume - premeasured
Cure Schedule	24 hours

Warranty: Static Solutions, Inc. expressly warrants that for a period of (1) one year from the date of purchase any Static Solutions, Inc. product will be free of defects in materials and will function within its specifications. Within the warranty period, the product will be repaired or replaced at Static Solutions, Inc.'s option with no cost to the customer as long as Static Solutions, Inc. receives notice during the warranty period. Defective products must be shipped prepaid to Static Solutions, Inc.'s factory. Call Static Solutions, Inc.'s customer service at 508-480-0700 for a return authorization number. Include a copy of the invoice, packing slip, or other proof of purchase.

Warranty Exclusion: The foregoing express warranty is made in lieu of other product warranties express and implied, including merchantability and fitness for a particular purpose which are specifically or indirectly disclaimed. The express warranty will not apply to defects or damage due to neglect, misuse, accidents, alterations, operator error, failure to properly maintain, follow instruction, or failure to clean or repair products.

Limit of Warranty: In no event will Static Solutions, Inc. or seller be responsible or liable for special, incidental or consequential losses or damages, whether based on tort, contract, or the use of or inability to use the product. Before using the product users shall determine the suitability of the product for their intended use. The users assume all risk and liability whatsoever in connection therewith. Fulfillment of Static Solutions, Inc.'s warranty obligations will be the customer's exclusive remedy and Static Solutions, Inc. and seller's limit of liability for any breach of warranty or otherwise.

For additional OHM-SHIELD™ product literature, call or fax the Static Solutions, Inc. sales department.

DISTRIBUTED BY:

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Please call us at 508.480.0700
or log on to our website, www.staticsolutions.com,
or www.staticsolutions.co.uk to find your local distributor.

APPLICATION OF OHM-SHIELD ® CE-5800 EPOXY FLOOR PAINT

THIS IS A TWO PART EPOXY COATING- MIX ACCORDING TO **4:1** RATIO BY VOLUME.

THERE IS A 4 HOUR POT LIFE. COATINGS APPLIED AFTER 4 HOURS WILL NOT HAVE HIGH ABRASION

FOR NEW CONCRETE FLOORS

ALWAYS APPLY A TEST PATCH PRIOR TO COATING LARGE AREAS

1. Clean and remove dirt/grease
2. Acid etch if necessary following the manufacturers directions. If not, proceed to #6.
3. Rinse twice with clean water.
4. Allow to dry for at least 24 hours Determine porosity of floor using porosity test*. Very dense, non-porous or treated concrete may require additional treatment.
5. If necessary apply PS-5800 primer-sealer. Test for concrete adhesion before applying paint. PS-5800 is used to fill porous floors in addition to aid in adhesion. Cure for 24 hours.
6. **Apply a test patch.**
7. Check for dryness**
8. Clean dirt/grease from sealed concrete
9. Do not apply OHM-SHIELD CE-5800 if room and floor temperature are less than 60 ^{0} F. Always apply an adhesion test patch prior to coating large areas.
10. Use a ¼" cotton or polyester nap roller with a five foot extension handle.
    THOROUGHLY MIX OHM SHIELD CE-5800 parts A and B with mixer or stirrer using a 4:1 ratio by volume.
    Confirm that the conductive additives which may have settled are properly dispersed to assure the correct adhesion and conductivity.
    Add 10-20 % as needed of water for spraying.
11. Apply in long continuous strokes assuring complete coverage.
12. Use a china white, nylon or animal hair fine bristle brush to paint hard to reach areas and trim.
13. Allow floor to dry overnight at not less than 60 ^{0} F before walking (light foot traffic) on the surface.
14. After drying, test the floor with a surface resistivity meter. If the reading is greater than 10 ^{8} ohms per square and/or the readings are not within a decade of each other over five separate test spots, apply second coat of OHM-SHIELD CE-5800.
15. Allow floor to dry 3 days (72 hours minimum) at not less than 60 ^{0} F before allowing general industrial traffic.

THERE IS A 4 HOUR POT LIFE

FOR OLD CONCRETE FLOORS

ALWAYS APPLY A TEST PATCH PRIOR TO COATING LARGE AREAS

NOTE: Simple cleaning may be insufficient to obtain maximum adhesion of OHM-SHIELD CE-5800 to old concrete floors. Proper maintenance and exposure to polyethylene wax, silicone and epoxy sealers, oil spills and other chemicals will adversely affect product performance.

1. If test patch is acceptable, follow instructions under "NEW CONCRETE FLOORS" at Step #3.
2. If test patch shows unacceptable adhesion after standing 14 days, proceed with the following: Grit sand or use a solvent on the surface in order to remove all embedded sealers, waxes, floor polishes, oils, coatings, greases, brake fluids and chemical spills of any type.
   NOTE: CONSULT YOUR CONCRETE CONTRACTOR FOR DETAILS ON PROPER EQUIPMENT AND PROCEDURES FOR FLOOR SANDING.
   After sanding, wash the floor with detergent and warm water, then wet vacuum. RINSE TWICE. Allow floor to dry completely. If necessary apply OHM SHIELD CE-5800 primer-sealer by following the application instructions. Apply another test patch. If adhesion is acceptable, proceed with Step #3 under "NEW CONCRETE FLOORS".

NOTE: FOR GLOSSIER APPEARANCER, APPLY OHM-SHIELD AF-5500 or AF-6500 ACRYLIC FLOOR FINISH TO INCREASE GLOSS AND TO INCREASE THE ABRASION RESISTANCE.

SEE PRODUCT LABEL-MSDS FOR REGULAR SAFETY AND MAINTENCE INSTRUCTIONS.

*Porosity Test- Pour one ounce of water on floor. If water soaks in the surface can be coated. If the water beads up then the surface must be abraded.
*Dryness Test- Place a rubber mat on surface for 24 hours. After 24 hours observe the bottom of mat. If it is dry apply the coating. If wet, apply a primer or sealer. ALWAYS WEAR PROTECTIVE GOGGLES.

THERE IS A 4 HOUR POT LIFE

APPENDIX B

ASTRO ELECTROPLATING QUALITY ASSURANCE/QUALITY CONTROL PLAN

ASTRO ELECTROPLATING

QUALITY ASSURANCE/QUALITY CONTROL PLAN

TOWN OF BABYLON
FARMINGDALE, NEW YORK

AUGUST 2003

NYSDEC SITE CODE #1-52-036
JOB NO. 96033

PREPARED FOR:

ASTRO ELECTROPLATING
170 CENTRAL AVENUE
FARMINGDALE, NEW YORK

TABLE OF CONTENTS

SECTION 1.0 PURPOSE

The purpose of this Quality Assurance/Quality Control (QA/QC) plan is to ensure that the construction activities for the Astro Electroplating Remediation Project are performed in accordance with the best industry practices and in conformance with the various local, state and federal rules and regulations.

Quality Control is a planned system of routine inspections that is used to directly monitor and control the quality of a construction project. Quality Control refers to the measures taken by the installer or contactor to determine compliance with the requirements for materials and workmanship as detailed on the approved construction plans. These measures are typically performed by the geosynthetics manufacturer or installer, or for natural soil materials by the earthwork contractor, and are necessary to achieve quality in the constructed or installed system.

Quality Assurance is a planned system of activities that provides assurances that the facility was constructed as specified on the approved construction plans. Quality Assurance includes inspections, verifications, audits and evaluations of materials and workmanship necessary to determine and document the quality of construction. These measures are typically taken by the project engineer to assess if the installer or contractor is in compliance with the approved plans.

SECTION 2.0 KEY PERSONNEL AND DUTIES

This manual references different parties which may be involved in the liner installation process. A successful liner installation depends on the responsible and timely interaction of all involved parties and coordination of all installation, inspection, testing, and documentation.

Owner

Owner of the property and/or facility; responsible for the final acceptance of the work done on his property/facility.

Project Manager

Authorized representative of the owner; in charge of project scheduling and coordination of construction activities.

Designer

Engineering entity responsible for project planning, design, specifications, and drawings. The designer may also be the project manager.

Field Engineer

The field engineer works under the supervision of the Project Manager. Typical duties include periodic field observation and inspection services to ensure work is progressing on schedule in compliance with the approved plans and specifications. The Field Engineer will also provide resolution to any construction field problems which may occur during the project.

Field Inspector

Works directly for the Project Manager or Field Engineer and is on-site during all periods of membrane installation. The Field Inspector will prepare detailed reports on the progress of work, take construction photos, prepare as-built sketches and all other required services required by the Project Manger or Field Engineer. Forms to be used can be found in Appendix A of this document.

General Contractor

Prime contractor for the project; may delegate specific tasks in a contractual agreement to one or more subcontractors. The general contractor is sometimes the liner system installer and/or the earthwork contractor.

Liner System Installer

Subcontractor for the complete installation of the synthetic liner system; must perform according to its contract with the owner or the general contractor.

Liner Manufacture

Manufacturer of the geomembrane from raw material (resin).

Soil CQA Consultant

Party, independent of the general contractor and the liner installer, in charge of monitoring, testing, inspecting, and documenting all earthwork. Also called soil inspector.

Geosynthetic CQA Consultant

Party, independent of the general contractor and the liner installer, who monitors, tests, inspects, and documents the installation of all geosynthetic materials, i.e. geomembranes, geotextiles, geonets, and geogrids. Also called third party CQA or liner inspector.

Independent Laboratory

Testing laboratory unaffiliated with the geosynthetic material manufacturer, installer, or the general contractor for a project.

SECTION 3.0 MANUFACTURER'S QUALITY ASSURANCE AND QUALITY CONTROL PLAN

The supplier of the geomembrane used on this project shall have in place prior to manufacturing any product for this project a Manufacturing QA/QC plan. A copy of this plan shall be provided to the engineer if requested.

SECTION 4 MEETINGS

A pre-construction meeting shall be held at the work site prior to commencing the liner installation to discuss work activities, quality control and quality assurance procedures.

A daily meeting shall be held at the work site just prior to commencing the work day. The meeting must include the installer and the liner inspection and will include discussion of both recently completed and imminent activities.

Pre-Construction Meetings

A meeting should be held after award of the contract and prior to starting the construction of the facility to resolve any uncertainties and review construction objectives. The owner, designer, CQA personnel, general contractor and the subcontractors should attend this meeting to discuss the following topics:

1. The familiarization of all parties with the site-specific Construction Quality Assurance plan and its role relative to the design, plans, and specifications.
2. The responsibilities of each party
3. The chain of command and communication protocols.
4. The merits of established procedures/protocols for observations and tests (including sampling strategies).
5. The merits of established procedures/protocols regarding construction deficiencies, repairs and retesting.
6. Methods for documenting and reporting inspection data.
7. Security and safety protocols for the work area.

The pre-construction meeting should conclude with a walk around the site to review construction materials and inspect equipment storage locations. A designated person should document the meeting and minutes should be distributed to all parties.

Daily Progress Meetings

A daily progress meeting shall be held at the work site prior to commencing the work day. The meeting must include the installed and the liner inspector. The purpose of the meeting is to:

1. Review the previous day's activity.
2. Agree of measurements and specific areas of the previous day's approved work.
3. Review the work schedule.
4. Review work activity and location for the day.
5. Discuss the installer's personnel assignments for the day.
6. Discuss possible problem areas and situations.

SECTION 5 MATERIAL LOGISTICS

Transportation

Geomembrane rolls or panels shall be packaged and shipped in a manner that will protect them from damage. Transportation is the responsibility of the liner manufacturer or the installer.

Delivery

Off-loading and storage of the geomembrane is the responsibility of the installer, or the general contractor if delivery precedes the job site arrival of installer personnel. When shipped in closed trailers, the geomembrane should be loaded and unloaded by lifting rather than by pushing and pulling. Front-end loaders equipped with long rods shall be used for rolled geomembrane and forklift loaders are to be used from palletized geomembrane.

In cases where stacking of the geomembranes might be of concern, the delivery trailer should be inspected at the job site for squashed rolls or crushed boxes. The installer is responsible for replacing any damaged or unacceptable materials at no cost to the Owner. No off-loading shall be done unless the field inspector is present. Damage during off-loading shall be documented by the field inspector and the installer. All damaged rolls must be separated from the undamaged rolls until the proper disposition of that material has been determined.

On-Site Storage

Unless the geomembrane is used directly as it comes off the shipping trailer, a safe storage area should be provided. Stored geomembrane shall be safely protected against puncture, dirt, grease, moisture, mud, excessive heat and other underisible conditions. The rolls of geomembrane should be elevated off the ground or at least placed on a prepared smooth dry surface (not wooden pallets) free of vegetation, stumps or other sharp objects. Geomembrane rolls shall not be stacked more than two high on soil subgrades. This requirement does not necessarily apply where a concrete pad or warehouse is available for storage purposes. Palletized geomembranes should be stored on dry, level ground with similar considerations.

Covering is usually not necessary providing the geomembranes are installed within a short period of time. When the geomembranes are to be stored on the site for months or longer, they should be covered and/or have an enclosure around them for protection.

SECTION 6 EARTHWORK

Subgrade

The subgrade must be prepared according to the site specific plans and specifications. Line and grade must be established and verified before any geomembrane is brought to the facility and positioned. The Owner and his representatives shall inspect the subgrade preparation prior to liner installation.

Prior to liner installation the subgrade shall be compacted according to the project specifications. Weak or compressible areas which cannot be satisfactorily compacted shall be removed and replaced with properly compacted fill. Ruts caused by compaction equipment or by the geomembrane placement equipment must be leveled prior to liner placement. All surfaces to be lined shall be smooth, free of all foreign and organic material, sharp objects, or debris of any kind. The subgrade shall provide a firm, unyielding foundation with no sharp changes or abrupt breaks in grade. Standing water or excessive moisture shall not be allowed. Stones or rocks over 3/8 inch diameter shall not be allowed in the top 6 inches of soil subgrade.

The installer, on a daily basis, shall approve the surface on which the geomemebrane will be installed. After the supporting soil surface has been approved, it shall be the installer's responsibility to indicate to the inspector any changes to it conditions that may require repair work.

Vegetation Control

The general contractor, if necessary, shall sterilize the liner installation area using an effective soil sterilant specifically formulated for vegetation present in the area. The sterilant shall not be harmful to the liner and shall be applied according to its manufacturer's recommendations.

Anchor Trench

The anchor trench shall be excavated to the line, grade, width and depth shown on the construction drawings, prior to liner system placement. The soil inspector shall verify that the anchor trench has been constructed according to the construction drawings.

If the anchor trench is located in a clay susceptible to desiccation, no more than the amount of trench required for the base geomembrane to be anchored in one day shall be excavated to minimize desiccation of the anchor trench soils. Slightly rounded corners shall be provided in the trench where the geomembrane adjoins the trench so as to avoid sharp bends in the geomembrane.

Material Testing

The general contractor shall coordinate with the independent testing lab to provide access to the subgrade for the purpose of performing compaction testing on the subgrade. Compactions test shall be done, at a minimum in two places on each lift or every 20 cubic yards of material placed. Compaction testing shall be performed using the modified proctor test methods. A copy of the laboratories test methods shall be provided by the laboratory, when requested. All test methods used shall meet current ASTM requirements and procedures. See Table 1 in Appendix E for additional testing requirements.

The laboratory shall provide written confirmation of the test results to Owner, the Engineer, and the New York State Department of Environmental Conversation.

SECTION 7 LINER DEPLOYMENT

General

The rolls shall be deployed using a spreader bar assembly attached to a loader bucket or by other methods approved by the project engineer. Geomembrane should never be placed in ponded water. Such a procedure is indicative of a poor sequence of construction operations.

The liner installer is responsible for the following:

1. Equipment or tools shall not damage the geomembrane by handling, trafficking or other means.
2. Personnel working on the geomembrane shall not smoke or wear damaging shoes.
3. The method used to unroll the panels shall not score, scratch or crimp the geomembrane, or damage the supporting roll.
4. The method used to place the panels shall minimize wrinkles.
5. Adequate loading (i.e. sand bags or similar items that will not cause damage to the geomembrane) shall be placed to prevent uplift by wind. In cases of high winds, continuous loading is recommended along edges of the panels to minimize risk of wind flow under the panel.
6. Direct contact with the geomembrane shall be minimized.

Field Seaming

Approved seaming processes are hot wedge fusion and extrusion fillet welding. On side slopes, seams shall be oriented in the general direction of the maximum slope (i.e. oriented down, not across the slope). In corners and odd-shaped geometric locations, the number of field seams shall be minimized.

No base T-seam shall be closer than 5-feet from the toe of the slope. Seams shall be aligned with the least possible number of wrinkles and "fishmouths." If a fishmouth or wrinkle is found, it shall be relieved and cap-stripped.

Seam Overlap

Geomembrane panels must have a finished minimum overlap of 4-inches for hot wedge fusion welding and 6-inches for extrusion welding.

Cleaning solvents may not be used unless the product is approved by the liner manufacturer.

Field Seam Testing

Field test seams shall be conducted on the liner to verify that seaming conditions are satisfactory. Test seams shall be conducted at the beginning of each seaming period and at least once each 4 hours, for each seaming apparatus and personnel used that day.

All test seams shall be made in contact with the subgrade. Welding rod used for extrusion welding shall have the same properties as the resin used to manufacture the geomembrane. The test seam samples shall be 10-feet long for fusion welding and 3-feet long for extrusion welding

with the seam centered lengthwise. Five specimens shall be cut from each end of the test seams by the inspector. The inspector shall use a tensiometer to test 5 specimens for shear and 5 specimens for peel. Each specimen shall be one inch wide with a grip separation of 4-inches plus the width of the seam. The seam shall be centered between the clamps. The rate of grip separation shall be 2-inches per minute. Test results for seam strength properties shall be the average of five specimens. Four out of the five specimens shall pass seam acceptance criteria. Shear and peel tests shall result in Film Tearing Bond (FTB), which is a failure in ductile mode of one of the bonded sheets by tearing prior to complete separation in the bonded area. If a test seams fails to meet field seam specifications, the seaming apparatus and/or seamer shall be not accepted and shall not be used for seaming until the deficiencies are correct and successful test seam is achieved.

SECTION 8 WEATHER CONDITIONS

Liner deployment shall proceed between ambient temperatures of 32°F and 104°F. Placement can proceed below 32°F only after the installer demonstrates to the inspector that the material can be seamed to meet the project specifications. Geomembrane shall not be placed during precipitation or moisture of any type (i.e fog, rain, dew) or in the presence of excessive winds, as determined by the installer supervisor. Observation of temperature, humidity, precipitation, and wind should be noted to ensure that weather conditions are acceptable prior to liner placement.

SECTION 9 SEAMING EQUIPMENT AND ACCESSORIES

Approved equipment for field seaming are hot wedge fusion welders and extrusion fillet welders.

1. Hot Wedge Welder, 100 Volt (220 Volt)
2. Extrusion Welder, 220 Volt
3. 6.5 KW Generator, single-phase with 110/220 Volt Outputs.

SECTION 10 HOT WEDGE WELDING

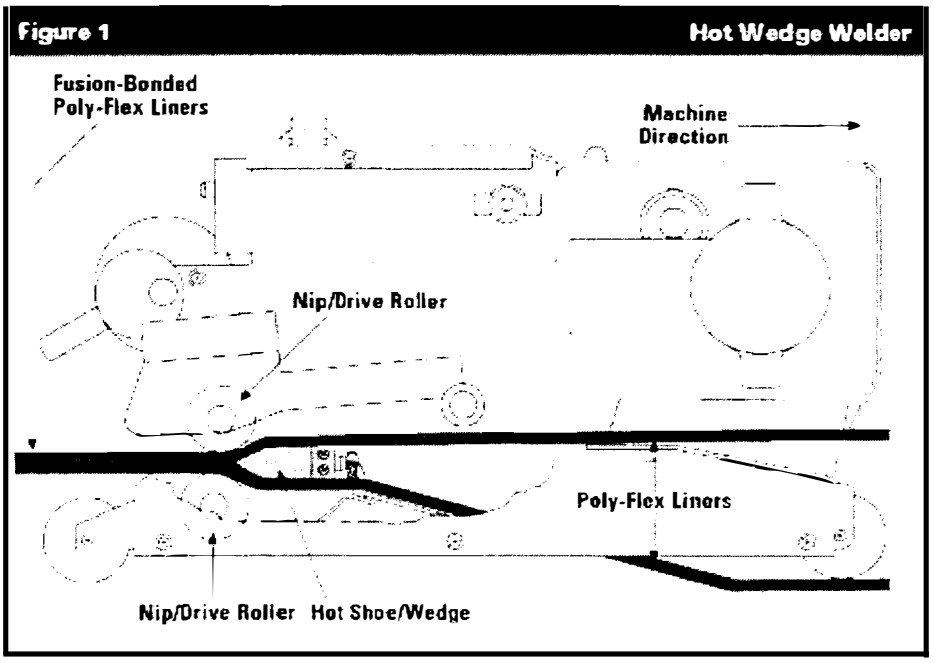
Hot Wedge Welding System

Hot wedge welding represents the primary seaming method for liners. The hot wedge seaming device is a completely self-contained system. The hot wedge system (Figure 1) produces a bonded seam by running a hot metal wedge between the overlapped area of the liners. The hot wedge melts the facing surfaces of the two liners and creates a permanent bond between them using controlled heat and pressure. The wedge is square at the leading end and tapered at the trailing end. The heated geomembrane overlaps come together at the tapered end of the hot wedge, under pressure from two nip/drive rollers, and are permanently fused together. Hot air tacking (as employed in extrusion fillet seaming) is not necessary.

The dual hot wedge has a central, canal-like recession along its length. This type of wedge creates a channel in the liner seam between two parallel bonds.

Knurled rollers are used to apply pressure to the sheets where they have just passed over the taper of the hot wedge and been bonded. These rollers should have smooth surfaces and beveled edges.

As the liners pass through the welder, they must contact the full length and width of the hot wedge, or the facing surfaces will not be equally hot. Contour rollers or similar pressure devices, which press the liners against both sides of the hot wedge, must be adjusted so that material of any thickness conforms to the wedge's taper while passing through the welder. Such adjustments should be made while the wedge is cold.



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This seaming method is designed to:

1. Monitor operating temperatures via digital readout.
2. Form uniform bonds by applying uniform and consistent pressure to the seam area.
3. Reduce surface tension and remove surface contamination without grinding, which improves bond strength.
4. Ensure high reliability, which results in consistent seam integrity.
5. Minimize operator error, as the machine is semi-automatic.

Liner Preparation for Hot Wedge Welding

The following steps shall be taken to prepare the liner for hot shoe seaming:

1. The two liners to be joined must be positioned to create an overlap of 4-6 inches.
2. If the overlap is not substantially wide to contain the wedge, "float" the liner into better position by lifting it high enough to draw air beneath it, guiding it upon this air to an improved position. Avoid dragging the liner, particularly across rough soil subgrades.
3. If the overlap between the liners is excessive, the excess must be trimmed away. This should be done by trimming the lower sheet. If this is not possible and the upper sheet must be trimmed, use a knife with a shielded or hook blade. An unshielded, downward-facing blade cutting from above can easily scratch the liner in a vulnerable location.
4. All cutting and preparation of odd-shaped sections or small fitted pieces must be completed ahead of the seaming operation, so that seaming may be conducted with no interruptions.
5. Before joining the two contiguous liners, make sure they are not excessively scratched, blemished or flawed, and are visually acceptable.
6. If the Plans require panels to be shingled in a particular direction, make sure this is being done.
7. Excessive undulations (waves) along the seams during the seaming operation should be avoided. These occur when the upper and lower sheets have unequal slack between them. This condition can lead to the undesirable formation of "fishmouths," which must be trimmed, laid flat and patched.
8. Polyethylene liners need slack to allow for expansion and contraction caused by weather changes.
9. Sheets which are overlapped and ready for seaming must be clean. If dirty, they must be wiped clean with dry rags.
10. The seam area must be completely free of moisture before the overlapping sheets can be properly seamed. Dry rags can be used to wipe any such moisture from the seam surface. If a sufficient quantity of dry rags is unavailable for this purpose, air blowers can be used.
11. Seaming is not to be performed during rain or snow unless measures are taken to allow the seam to be made on dry liner materials, e.g., within an enclosure or shelter.
12. Seaming is not to be performed when the soil surface beneath the liners is saturated because the hot seaming apparatus will draw moisture into the ongoing seam. Seaming activity on frozen soil is unacceptable for the same reason. Puddled water on the soil's surface beneath the liner is unacceptable.
13. Seaming should be conducted only when ambient temperatures are 32-104° F (0-40° C), unless it can be proven via test strips that good seams can be fabricated at such temperatures.
14. When seaming in cold weather, it is advisable to preheat the sheets with a hot air blower and to conduct seaming activity within a portable tent, to help prevent heat loss. Extra test welds can be used to make any necessary adjustments to the seaming activity.

Hot Wedge Equipment Preparation

1. A generator must be kept in the proximity of the seaming area with enough extension cord to range the length of the seam. It must either be fitted with rubber tires or be placed on a stable and smooth moveable base, such as an excess of liner, so that no damage will be inflicted upon the liner or subgrade by its movement. The generator's fuel (gasoline or diesel) must be stored off the liner.
2. Surface grinding before application of the hot wedge is not necessary and shall not be done.
3. The hot wedge, or "anvil," should be inspected to see that it is symmetrically balanced and gradually tapered. It is imperative that a wedge has no sharp edges on any surface that contacts the liner during the welding process.
4. The chain drive powering any portion of the welder should be synchronized, properly lubricated, and physically sound.

Contour roller heights are adjustable to allow for varying liner thicknesses. Normal adjustments are made while the welder is at ambient temperature. The procedure is as follows:

1. Insert two material samples into the nip drive rollers.
2. Place two other material samples above and below the wedge.
3. Lock the wedge into its operating position. This is done by shifting the wedge forward, into the clutch of the upper and lower nip rollers.
4. Adjust the contour rollers until they are snug against the liners, which sandwich the wedge.
5. Set the maximum distance that the wedge can move into the nip rollers. Unsecured, the wedge might make direct contact with the nip rollers when the machine has no liner material running through it and damage the machine.
6. The wedge and surrounding rollers are now set for seaming the liner. Remember to disengage the hot wedge from its forward position in the roller apparatus as the machine reaches the end of a seam. This will keep the wedge from advancing into the nip rollers and damaging them.
7. The forward face of the welding machine should be inspected for sharp corners and irregular details which may damage the liner as it advances during the seaming process.
8. Temperature controllers on the wedge device should be set according to liner thickness, ambient temperature, and seaming rate. The "test strip" helps determine these settings. Temperature gauges should be checked for accuracy and repeatability

Hot Wedge Seaming Process

Polyethylene liners can be seamed by the hot wedge method, but temperature settings will vary according to the grade of polyethylene used. Typical wedge temperature ranges for hot wedge seaming is as follows:

Liner Type	**Minimum[1] °F (°C)**	**Maximum[2] °F (°C)**
HDPE	600 (315)	752 (400)
LLDPE	600 (315)	716 (380)

[1]For dry, warm weather seaming conditions.

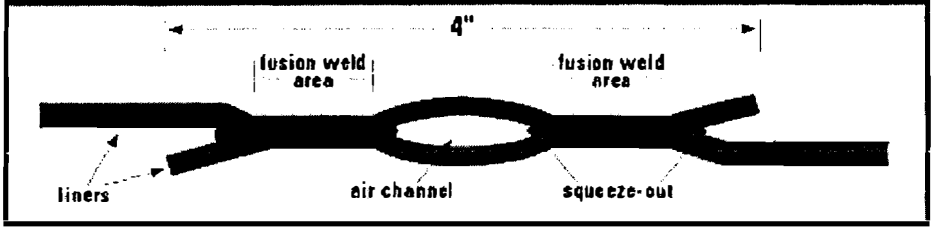
[2]For damp, cold weather seaming conditions.

1. The hot wedge system should be properly positioned for making the desired dual (split) seam.
2. Ambient variables such as temperature, cloud cover, and wind speed may make it necessary to adjust the wedge temperature. It may be useful to document wedge temperatures used successfully in a variety of ambient conditions, so that the hot wedge can be more accurately adjusted to new conditions.
3. The drive motor should be off when positioning the welding machine to seam. Guide the overlapped material between the contour rollers and the wedge and into the drive/nip rollers. When the nip rollers engage and the wedge is in position, turn on the drive motor. Move the hot wedge into position and lock it.
4. The operator must constantly monitor the temperature controls, as well as the completed seam passing through the machine. Occasional adjustments in speed may be necessary to maintain a consistent weld.
5. On soft soils, the device tends to "bulldoze" into the ground as it travels, causing soil to enter the weld. A contaminated weld is unacceptable. To avoid this, the operator should slightly lift the front of the machine. Alternatively, a movable base can be used. Strips of geomembrane have proven to be effective materials on which the welder can maintain traction. It is recommended that at least two people work together in making hot wedge seams: one as operator and one as helper.

After Hot Wedge Seaming

1. A small amount of "squeeze-out" is a reliable indication that proper seaming temperatures have been achieved (Figure 2). The melted polymer will laterally extrude out of the seam area in properly welded seams. An excessive amount of extruded hot melt indicates that excessive heat or pressure, or both, was applied. Reduce the temperature and/or pressure to correct the situation.

Figure 2 **Cross-Section of Dual (Split) Hot Wedge Seam**



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2. The liners show a long, low, sinusoidal wavelength pattern in the direction of the seam which indicates a proper weld. If the wave peaks are too close together, machine speed should be increased until a satisfactory pattern appears. The absence of this wavelength pattern indicates that machine speed should be decreased. No wavy pattern will occur on liners thicker than 40 mil due to the inherent stiffness of the thicker liners.
3. Nip/drive roller marks will always show on the surface when using knurled rollers. They should be noticeable to the eye, but just barely to the touch.
4. The hot wedge device has adjustable parts. It is critical that they be checked after a day of seaming. The machine should also be cleaned.

SECTION 11 EXTRUSION FILLET WELDING

Extrusion Fillet Welding System

Extrusion fillet welding is used for patches and around details such as pipes and sumps. An extrusion weld is produced by using a 4 or 5 mm diameter welding rod. The welding rod is applied as a "welded bead" at the edge of two overlapped liners, resulting in an extrusion seam.

Liner Preparation for Extrusion Fillet Welding

The two liners to be joined must be positioned to create an overlap of at least 6 inches. Follow the same general guidelines as specified for liner preparation for hot wedge welding.

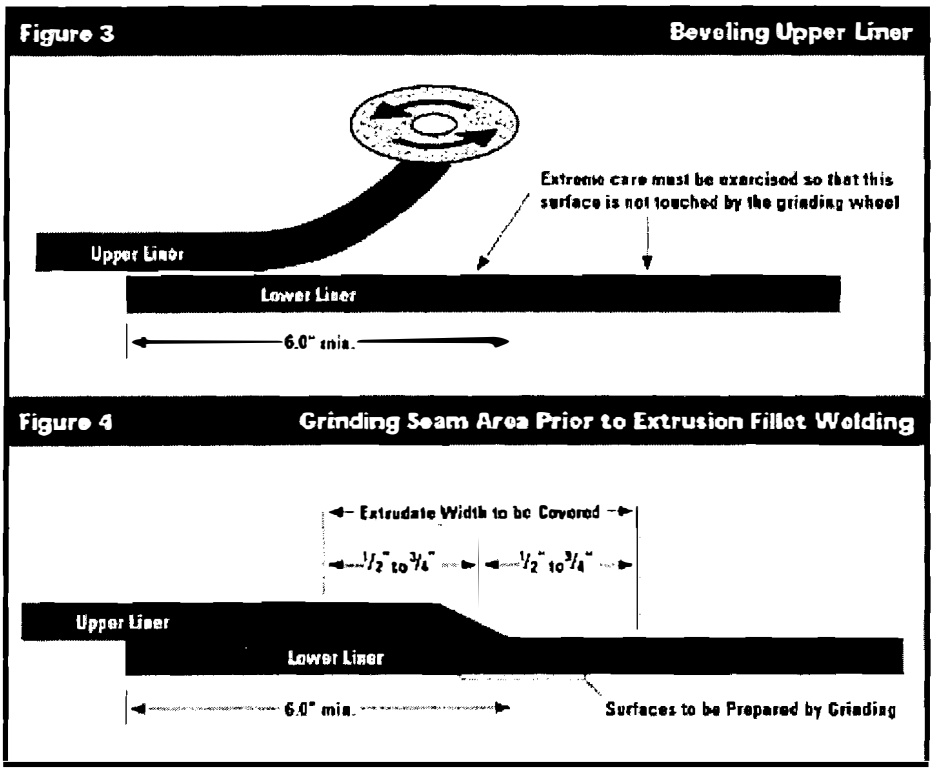
Extrusion Equipment Preparation

1. A generator must be kept in the proximity of the seaming area. It must either be fitted with rubber tires, or be placed on a stable and smooth moveable base, such as an excess of liner, so that no damage will be inflicted upon the liner or subgrade by its movement. The generator's fuel (gasoline or diesel) must be stored off the liner.
2. A hand-held electric rotary grinder having a circular disk grinding plate approximately 4.5 inches in diameter and adequate #80 grit paper must be available. Sandpaper coarser than #80, e.g. #60, is not acceptable for smooth liners.
3. A hot air welder capable of 600° C must be available to tack the liner after they are properly positioned.
4. All extrusion fillet seaming devices must be equipped with a properly functioning temperature controller which displays the extrusion temperature.
5. All types of extrusion fillet seaming devices have teflon dies, varied in shape and size, through which the extrudate passes onto the liner. These dies must be inspected for wear, sharp notches and creases, and for their appropriateness to the application at hand.

Extrusion Fillet Welding Process

1. Surfaces shall be clean and dry.
2. For liners 50 mils and thicker, the upper sheet's leading edge must be ground to a 45° bevel (Figure 3). It is imperative that the sheet be lifted up and away from the lower sheet during the beveling so that no deep gouges are cut in the lower sheet. Beveling should therefore be done before tack welding.
3. A hot air device should be used to "tack" the two sheets together. The hot air gun prepares the seam for the extrusion welder by creating a light bond between the two sheets, securing their position. The hot air gun is not meant to create a primary seam. No heat distortion should be evident on the surface of the upper sheet.
4. The area which is to receive the extrusion bead shall be ground to remove surface contamination and surface tension. Grind marks should not be deeper than 10% of the sheet thickness. Optimally, they should be about 5% of the sheet thickness (Figure 4). The only purpose of grinding is the removal of oxide layers and dirt from the liner surfaces and the roughening of their interface for the extrudate. All material dust generated by grinding the liner sheets must be blown away from the seaming area.
5. Grinding marks should not extend beyond 1/4 inch of either side of the extrudate after its placement. For example, if the final extrudate bead width is 1.5 inches, the width of the grinding trail should not exceed 2 inches.

6. Seaming must take place no more than 10 minutes after grinding, so that surface oxide layers do not reappear where the extrudate must be placed.
7. The welding rod shall be free from dirt, dust, moisture and tangles at all times.



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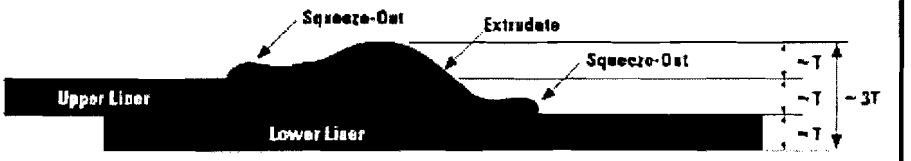
8. The extrusion welder's barrel shall be purged of all heat-degraded extrudate for approximately 30 seconds before starting a seam. This must be done every time the extruder is restarted after two or more minutes of inactivity. The purged extrudate shall not be discharged on the surface of the liner or on prepared subgrade, where it could damage the liner.
9. Molten extrudate is deposited along the overlapped seam. The center of the extrudate passes directly along the edge of the upper liner, at sufficient width to completely cover the edge and most of the outlying grind marks, at least to within 1/4 inch of their extremity.
10. The bottom portion of the welding die shall stay in intimate contact with the sheet surface and conform to various seam angles and configurations.
11. The extrudate should be approximately twice the specified sheet thickness, measured from the top of the bottom sheet to the top or "crown" of the extrudate (Figure 5). Excessive squeeze-out (or "flashing"), as illustrated, is acceptable, if it is equal on both sides and will not interfere with subsequent vacuum box testing. The presence of squeeze-out may indicate that the extrusion die was not riding directly against the liner, that the extrudate temperature was improper for adequate flow, or that the seaming rate was too slow.
12. Where possible, inspect the underside of the lower liner for heat distortion. This can be done at the end of seams, and wherever samples are cut out of the seam. A slight amount of thermal "puckering" on relatively thin liners (less than 50 mil) is acceptable. It indicates that heat penetrated entirely through the sheet. However, if the underside is greatly distorted, either lower the temperature or increase the rate of seaming. For liners 80 mil and greater, no thermal "puckering" should take place.

13. If the seaming process must be interrupted at mid-seam, the extrudate should trail off gradually, not terminate in a large mass of solidified extrudate. Where such welds are abandoned long enough to cool, they must be ground prior to continuing with new extrudate over the remainder of the seam. Grind where the extrudate trail-off begins. This restart procedure must be followed for patches, pipes, fittings, appurtenances and "T" and "Y" shaped seams.

Figure 5 **Extrusion Fillet Seam Cross-Sections**



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After Extrusion Fillet Seaming

1. A smooth insulating plate or heat insulating fabric is to be placed beneath the hot welding apparatus after usage. The tip die and barrel must not be placed on any liner or other geosynthetic surface, as it is extremely hot and can cause severe damage.
2. The extrudate bead should be visually inspected for alignment, height, and surface texture uniformity. The extrudate should be free of bubbles and pock marks which indicate the undesirable presence of air, water or debris within the extrudate rod or pelletized polymer.
3. Grind marks should not be visible more than 1/4 inch beyond the extrudate. These should be very light and not contain heavy gouges. Grinding is considered excessive when it is deeper than 10% of the liner thickness. It is unacceptable to apply additional extrudate over the original extrusion fillet seam in an area of excessive grinding. A cap strip shall be placed over the entire portion of the seam where excessive grinding is located.

SECTION 12 UNUSUAL CONDITIONS

Seaming should proceed when ambient air temperature is between 32 -104°F (0-40° C). At temperatures below freezing, special precautions must be taken. Shielding, preheating, increasing extrudate temperature, and/or decreasing the rate of seaming may be necessary. Thawed subgrade moisture in the seam area shall not be tolerated. Frozen irregularities in the subgrade could cause problems. Temperatures outside the given range generally necessitate more frequent testing of trial welds.

High winds, or gusts of wind, always pose problems for liners. After unrolling the liner, the panels must be securely ballasted with sandbags. The seaming process, however, will necessitate the removal of some of the sandbags, which will leave any windward edge vulnerable to wind uplift. Properly orient the overlap to prevent wind uplift. Additional labor may be needed for the sole purpose of removing the sandbags immediately ahead of the seaming operation as it moves along, and immediately replacing them as the welder passes. Any dirt and moisture left behind during the movement of sandbags must be cleaned away.

SECTION 13 SEAM TESTING

Non-Destructive Seam Testing

The installer shall non-destructively test every field seam over its full length. All test equipment shall be furnished by the installer.

Vacuum Box Testing

Equipment for testing extrusion seams shall be comprised of the following:

1. A vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft rubber gasket attached to the bottom, port hole or valve assembly, and a vacuum gauge.
2. Soapy solution in a plastic bucket with a mop.

The following procedures shall be followed by the installer:

1. Excess sheet overlap shall be trimmed away.
2. Wet a strip of geomembrane approximately 12 inches by the length of box with the soapy solution.
3. Place the box over the wetted area and compress.
4. Create a vacuum of 3 - 5 psi.
5. Ensure that a leak tight seal is created.
6. For a period of approximately 15 seconds, examine the geomembrane through the viewing window for the presence of animated soap bubbles.
7. If no animated bubbles appear after 15 seconds, close the vacuum valve and open the bleed valve, move the box over the next adjoining area with a minimum 3 inches overlap and repeat the process.
8. All areas where animated soap bubbles appear shall be marked, repaired and then retested.

The following procedures shall apply to locations where seams cannot be non-destructively tested.

1. If the seam is accessible to testing equipment prior to final installation, the seam shall be non-destructively tested prior to final installation.
2. If the seam cannot be tested prior to final installation, the seams shall be spark tested according to the spark tester manufacturer's procedures.

Air Pressure Testing (For Double Fusion Seams Only)

Equipment for testing double fusion seams shall be comprised of the following:

1. An air pump equipped with pressure gauge capable of generating and sustaining a pressure between 25 and 30 psi.
2. A pressure gauge equipped with a sharp hollow needle.

The following procedures shall be followed by the installer:

1. Seal one end of the seam to be tested.
2. Insert needle or other approved pressure feed device through the sealed end of the channel created by the double wedge fusion weld.
3. Seal the other end of the channel.
4. Energize the air pump to a pressure between 25 and 30 psi, close valve, allow 2 minutes for the injected air to come to equilibrium in the channel, and sustain pressure for approximately 5 minutes.
5. If pressure loss exceeds 4 psi, or pressure does not stabilize, locate faulty area, repair and retest.
6. If pressure does not drop below the acceptable value after five minutes, cut the air channel open at the opposite end from the pressure gauge. The air channel should deflate immediately indicating that the entire length of the seam has been tested.

Destructive Seam Testing

Destructive seam testing should be minimized to preserve the integrity of the liner. The installer shall provide the inspector with one destructive test sample per project specifications (usually once per 500 feet of seam length) from a location specified by the inspector.

Sampling Procedure

In order to obtain test results prior to completion of liner installation, samples shall be cut and marked by the installer as the seaming progresses. The installer shall also record the date, location, and pass or fail description. All holes in the geomembrane resulting from obtaining the seam samples shall be immediately repaired and vacuum tested.

Size and Disposition of Samples

The samples shall be 12 inches wide by 36 inches long with the seam centered lengthwise. The sample shall be cut into three equal-length pieces, one to be given to the inspector, one to be given to the owner's representative and one to the installer.

Field Laboratory Testing

The inspector shall test ten 1 inch wide specimens from his sample, five specimens for shear strength and five for peel strength. To be acceptable, four out of the five specimens must pass.

Independent Laboratory Testing

The owner, at his discretion and expense, may send seam samples to a laboratory for testing. The test method and procedures to be used by the independent laboratory shall be the same as used in field testing.

Procedures for Destructive Test Failure

The following procedures shall apply whenever a sample fails the field destructive test:

1. The installer shall cap strip the seam between the failed location and any passed test locations.

2. The installer can retrace the welding path to an intermediate location (usually 10 feet from the location of the failed test), and take a sample for an additional field test. If this test passes, then the seam shall be cap stripped between that location and the original failed location. If the test fails, then the process is repeated.
3. Over the length of seam failure, the installer shall either cut out the old seam, reposition the panel and reseam, or add a cap strip.

Defects and Repairs

All seams and non-seam areas of the geomembrane shall be inspected by the inspector for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. The surface of the geomembrane shall be clean at the time of inspection.

Evaluation

Each suspect location in seam and non-seam areas shall be non-destructively tested as appropriate in the presence of the inspector. Each location that fails the non-destructive testing shall be marked by the inspector, and repaired accordingly.

Repair Procedures

1. Defective seams shall be cap stripped or replaced.
2. Small holes shall be repaired by extrusion welding. If the hole is larger than 1/4 inch, it shall be patched.
3. Tears shall be repaired by patching. Where the tear is on a slope or an area of stress and has a sharp end it must be rounded prior to patching.
4. Blisters, large cuts and undispersed raw materials shall be repaired by patches.
5. Patches shall be done by extrusion welding. The weld area shall be cleaned no more than 10 minutes prior to the repair. No more than 10% of the thickness shall be removed by grinding. Welding shall commence where the grinding started and must overlap the previous seam by at least 2 inches. Reseaming over an existing seam without regrinding shall not be permitted. The welding shall restart by grinding the existing seam and rewelding a new seam. Patches shall be round or oval in shape, made of the same geomembrane, and extend a minimum of 6 inches beyond the edge of defects. All patches shall be of the same material and thickness as the geomembrane.

Verification of Repairs

Each repair shall be non-destructively tested. Repairs that pass the non-destructive test shall be taken as an indication of an adequate repair. Failed tests indicate that the repair shall be repeated and retested until passing test results are achieved.

Daily documentation of all non-destructive and destructive testing shall be provided to the inspector by the installer. This documentation shall identify all seams that initially failed the test and include evidence that these seams were repaired and successfully retested.

Cover Soil Placement

The earthwork contractor shall place the soil cover layer over the liner system on a daily basis as soon as a lined area of the facility has been completed and accepted by the owner.

Extreme care shall be taken by the earthwork contractor not to damage the liner system during the cover soil placement. A minimum of 12 inches of cover soil is needed prior to placing any earth-moving machinery over the liner system. The soil and rock particles of the cover material shall be of such size and shape as not to damage the liner. The upper particles' size limit is usually 3/8 inch. Angular or sharp rock fragments are not allowed.

The earthwork contractor should conduct a test on the job site simulating field subgrade, liner system, and cover soil placement. The earthwork contractor should use the proposed method of cover soil placement and equipment to verify the integrity of the liner. The liner installer is not responsible for damage to the liner as a result of using unsuitable cover material or improper methods of cover placement over the liner. That is the responsibility of the earthwork contractor.

Cover soil shall be placed on side slopes from the bottom to the top of the slope. During the cover soil placement, the driver shall not make sharp turns or sudden starts and stops. The machinery speed shall be slow. Frozen soils are not to be used as cover material unless screened prior to placement.

Cover soils shall be placed during the coolest time of the day to prevent folds in the liner. Special techniques shall be implemented to isolate small liner ripples and prevent the liner from folding over itself during cover soil placement.

SECTION 14 BACKFILLING OF ANCHOR TRENCH

Unless otherwise specified, the anchor trench shall be backfilled and compacted by the earthwork contractor. Trench backfill material shall be placed and compacted according to the project specifications. Density tests shall be conducted at the rate of one test per lift per trench.

Care shall be taken when backfilling the trenches to prevent any damage to the geomembrane.

SECTION 15 GEOMEMBRANE ACCEPTANCE

The liner installer shall retain ownership and responsibility for the liner until installation is finished and verification of the adequacy of all field seams and repairs, including associated testing, is complete, at which time the owner shall accept the liner and assume ownership and full responsibility for it.

SECTION 16 ASPHALT CAP

The asphalt cap shall be installed in accordance with the approved plans and specifications and with standard industrial practices. All asphalt installed shall meet the Town of Babylon Building Department requirements for parking lots. The Contractor shall submit to the Engineer for approval an asphalt design mix. Once approved this mix shall be used for the project. If the contractor elects to changes mixes, a new design mix shall be submitted for approval prior to bring the new product on the site.

Upon arrival at the site, the asphalt truck drive shall furnish a copy of the batch ticket to the field inspector. The field inspector shall compare the mix on the truck to the design mix, any discrepancies shall be noted immediately and the truck shall be sent off site. Trucks which are approved for use at the site shall be checked for temperature to ensure the material has a sufficient temperature to obtain the proper compaction.

After placement of the asphalt material, the asphalt will be compacted with a mechanical roller. After compaction of the asphalt is complete, the contractor, the field inspector and the field engineer will inspect the final product for any ruts, uncompacted places, deformities or other areas of concerns. These areas will be marked and the contractor shall remove the defects/deformities and re-asphalt.

General maintenance of the asphalt cap will be by the Owner. Yearly the cap will be inspected for cracks, broken asphalt and other defects. If cracks are discovered they will be sealed using a commercially available liquid asphalt crack sealer. If the cracks are determined to be too large for sealing with liquid asphalt or damaged asphalt or other defects are discovered, the damaged area should be removed and replaced with fresh asphalt bring the asphalt cap back to it's original state.

APPENDIX A
CONSTRUCTION QUALITY ASSURANCE FORMS

Nelson & Pope

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

DAILY FIELD REPORT

Client:_____ **Project:**_____
Material:_____ **Installer:**_____
Manufacturer:_____ **Project #:** _____
Day: _____
Weather Conditions: a.m._____ **p.m.**_____

Summary of Events

Distribution:_____

Signature_____
Name_____

Nelson & Pope

WEEKLY SUMMARY REPORT

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

Week Ending: _____

Client: _____ **Project:** _____

Material: _____ **Installer:** _____

Manufacturer: _____ **Project #:** _____

For time period of: _____

Summary of Events

Distribution: _____

Signature _____

Name _____

Nelson & Pope

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

MATERIAL INVENTORY

Client:_____ **Project:**_____
Material:_____ **Installer:**_____
Manufacturer:_____ **Project #:**_____

INVENTORY							
Shipment No.	Date On Site	Roll No.	Batch No.	Length ft.	Width ft.	Size ft^2	CQA I.D.

Nelson & Pope

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

PANEL DEPLOYMENT LOG

Client: ______________________

Material: ______________________

Manufacturer: ______________________

Project: ______________________

Installer: ______________________

Project #: ______________________

Panel No.	Roll No.	Date	Time	Temp °F	Wind	Length (avg)	Width (avg)	Panel Area	Avg Thickness	CQA I.D.	Final

Nelson & Pope

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

TRIAL SEAM LOG

Client: ______________________ **Project:** ______________________
Material: ______________________ **Installer:** ______________________
Manufacturer: ______________________ **Project #:** ______________________
Geomembrane: ☐ SINGLE ☐ PRIMARY ☐ SECONDARY ☐ OTHER ______________________
Welding Type: ☐ EXTRUSION ☐ FUSION

Date	Time	Amb. Temp	Tech I.D.	Equip I.D.	Temp F C	Temp/Spd F C/ft/m	Peel			Shear			Pass/ Fail	Sample No.	CQA I.D.
							1	2	3	1	2	3			

Nelson & Pope

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

PRODUCTION SEAMING LOG

INCLUDING NONDESTRUCTIVE TESTING CHECKLIST

Client: _____ **Project:** _____
Material: _____ **Installer:** _____
Manufacturer: _____ **Project #:** _____
Geomembrane: ☐ SINGLE ☐ PRIMARY ☐ SECONDARY ☐ OTHER _____

SEAMING											CHECKLIST		
Seam No.	Location	Seaming Direction	Date	Amb Temp	Start Time	Tech I.D.	Equip I.D.	Trial Seam No.	NS #	CQA I.D.	Final ND Test Date	Final	CQA Mgr

Nelson & Pope

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

REPAIR LOG

INCLUDING NONDESTRUCTIVE TESTING

Client: _____ **Project:** _____

Material: _____ **Installer:** _____

Manufacturer: _____ **Project #:** _____

Geomembrane: ☐ SINGLE ☐ PRIMARY ☐ SECONDARY ☐ OTHER _____

REPAIR INFORMATION											NONDESTRUCTIVE TESTING				
Repair No.	Date	Tech I.D.	Equip No.	Repair Type	Location	Panel/ Seam	Length	Width	Area ft^2	CQA I.D.	Test Date	Tech I.D.	Test Type	Pass/ Fail	CQA I.D.

Repair Type: B – Bead P - Patch C - Cap

Nelson & Pope

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

VACUUM TESTING LOG

Client: _____ **Project:** _____
Material: _____ **Installer:** _____
Manufacturer: _____ **Project #:** _____
Geomembrane: ☐ SINGLE ☐ PRIMARY ☐ SECONDARY ☐ OTHER _____

Item Tested	Panel No.	Seam No.	Location/Segment	Repair No.	Date	Tech I.D.	Pass/ Fail	Date Retested	CQA I.D.

Item Tested: B - Bead P - Patch C - Cap RS - Reconstructed Seam CS - Capped Seam

Nelson & Pope

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

RETEST LOG)

AIR PRESSURE TESTING LOG

(INCLUDES

Client:_____ **Project:**_____

Material:_____ **Installer:**_____

Manufacturer: _____ **Project #:**_____

Geomembrane: ☐ SINGLE ☐ PRIMARY ☐ SECONDARY ☐ OTHER _____

Seam No.	Location/Segment	Date	Tech I.D.	Start Time	Start Pressure	Stop Time	Stop Pressure	Pressure Change	Pass/ Fail	Retest Date	CQA I.D.

Nelson & Pope

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

FIELD DESTRUCTIVE TEST LOG

(INCLUDES RETEST LOG)

Client:________________________ **Project:**________________________
Material:________________________ **Installer:**________________________
Manufacturer: ________________________ **Project #:**________________________
Geomembrane: ☐ SINGLE ☐ PRIMARY ☐ SECONDARY ☐ OTHER ________________________

Sample I.D.	Test Date	Seam No.	Location	Equip. I.D.	Peel			Shear			Field P/F	CQA I.D.	Lab P/F	Passing Sample	Total Passed	CQA I.D.
					1	2	3	1	2	3						

Nelson & Pope

CONSTRUCTION QUALITY ASSURANCE: GEOSYNTHETICS

MASTER PERSONNEL LOG

(INCLUDES RETEST LOG)

Client: _____ **Project:** _____

Material: _____ **Installer:** _____

Manufacturer: _____ **Project #:** _____

From: _____ **To:** _____ **Week No:** _____

Company	Position	Name	Mon.	Tue.	Wed.	Thur.	Fri.	Sat.	Sun.

PROBLEM/SOLUTION LOG

Nelson & Pope

Client: **Project:** _____

Materi _____ **Installer:** _____

Manufacturer: _____ **Project #:** _____

Date Problem Occurred:
Problem:
Location:
Probable Cause:
Actions:
Proposed Remediation:
Date Solution Implemented:

CERTIFICATE OF ACCEPTANCE
OF SOIL SUBGRADE SURFACE

Project I.D.: _____

Project No.: _____

Date: _____ Owner: _____

Contractor: _____

Acceptance Statement:

I, _____, an authorized representative of _____ hereby certify that the area is suitable for the installation of the specified geosynthetic materials.

Specific Area Being Accepted:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Contractor's Representative

Name_____ Signature _____ Date _____

Your Company: _____

Site Superintendent: _____

(Signature acknowledges acceptance of certification from _____ and that required CQA tasks have been performed)

Name_____ Signature _____ Date _____

FIELD CHANGE ORDER

This Field Change Order is intended to confirm that _____ of _____ is formally requesting (YOUR COMPANY NAME) to perform services which are not covered in the scope of services requested in the original request for proposal. _____ will reimburse (YOUR COMPANY NAME) for these additional services at the price agreed below.

Description of Services Requested:

_____

_____

_____

_____

Estimated Cost of Services Requested:

_____

_____

Start Date for Services Requested:

_____

Company Address:

_____ _____

Authorized Representative Authorized Representative

_____ _____

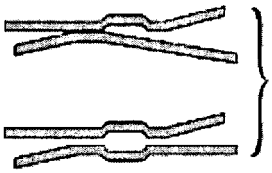
Printed Name Printed Name

_____ _____

Date Date

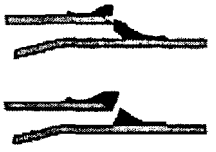
APPENDIX B
BREAK CODES/SEAMS CHARTS

Locus-of-Break Codes and Descriptions of Breaks for Dual Wedge-Weld Seams*

Type of Break	Code	Break Description	Classification
	AD	Adhesion Failure. Complete separation on one or both sides of the air channel.	Non-FTB
	BRK	Break in Sheeting.	FTB
	SE-1	Break at outer edge of seam. Break can be either top or bottom sheet.	FTB
	SE-2	Break at inner edge of seam.	FTB
	AD-BRK	Break in first seam after some adhesion failure. Break can be either top or bottom sheet.	FTB

* Henry Haxo, Matrecon Inc., Alameda, CA.
Lining of Waste Containment and Other Impoundment Facilities
EPA/ 600/ 2-88/ 052

Locus-of-Break Codes and Descriptions of Breaks for Extrusion Fillet-Weld Seams*

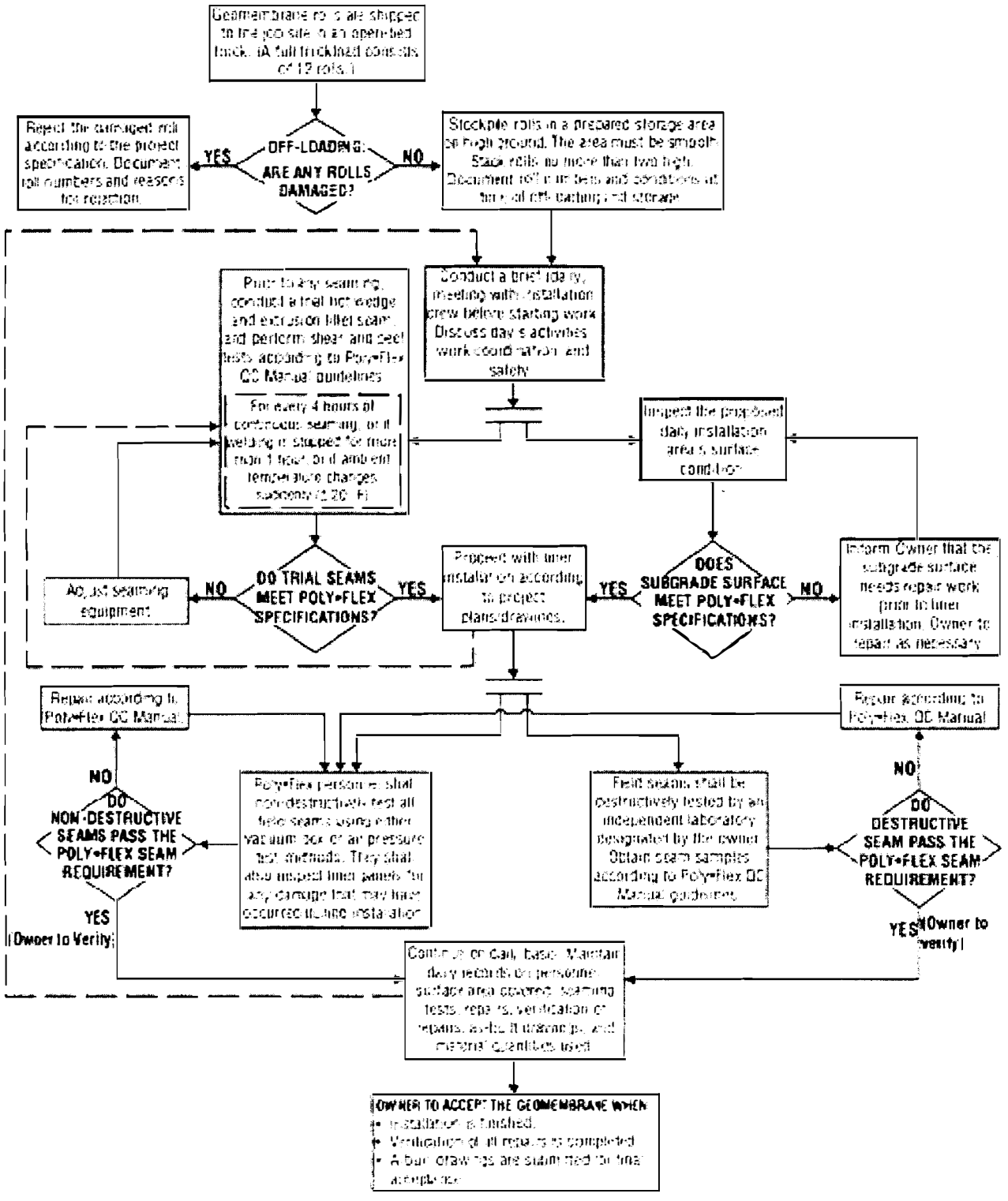
Type of Break	Code	Break Description	Classification
	AD-1	Failure in adhesion. Specimens may also delaminate under the bead and break through the thin extruded material in the outer area.	Non-FTB
	AD-2	Failure in adhesion.	Non-FTB
	AD-WLD	Break through the fillet. Such breaks range from those that start at the edge of the top sheet to those that run through the fillet after some adhesion failure between the fillet and the bottom sheet.	FTB
	SE-1	Break at seam edge. Specimens may break anywhere from bead/outer area edge to the outer area/buffed area edge. (Applicable to shear tests only.)	FTB
	SE-2	Break at seam edge. Specimens may break anywhere from bead/outer area edge to the outer area/buffed area edge.	FTB
	SE-3	Break at seam edge. (Applicable to peel tests only.)	FTB
	BRK-1	Break in sheeting. A "B" in parenthesis after the code means the specimen broke in the buffed area. (Applicable to shear tests only.)	FTB
	BRK-2	Break in sheeting. A "B" in parenthesis after the code means the specimen broke in the buffed area.	FTB
	AD-BRK	Break in sheeting after some adhesion failure between the fillet and the bottom sheet. (Applicable to peel tests only.)	FTB
	HT	Break at the edge of the hot tack for specimens which could not be delaminated in the hot tack. (Applicable to shear tests only.)	FTB

* Henry Haxo, Matrecon Inc., Alameda, CA.

Lining of Waste Containment and Other Impoundment Facilities

EPA/ 600/ 2-88/ 052

APPENDIX C
GEOMEMBRANE INSTALLATION FLOW CHART



Flow Chart by Poly-Flex, Inc. • 2000 W. Marshall Dr. • Grand Prairie, TX 75051 U.S.A. • 888-765-9359

APPENDIX D
REFERENCES

REFERENCES

1. "Quality Assurance/Quality Control Plan", Poly-Flex, Inc. 2000 W. Marshall Drive, Grand Prairie, TX. 75051.

2. "Reference Manual ",Poly-Flex, Inc. 2000 W. Marshall Drive, Grand Prairie, TX. 75051

3. "Design and Construction of RCRA/CERCLA Final Covers", United State Environmental Protection Agency Seminar Publication, EPA/625/4-91/025, May 1991.

APPENDIX E
RECOMMENDED MINIMUM TESTING FREQUENCIES DURING CONSTRUCTION

TABLE 1
RECOMMENDED MINIMUM TESTING FREQUENCIES DURING CONSTRUCTION

ITEM	TESTING	FREQUENCY
Back Fill	Grain Size	1 test every 1,500 Cubic Yards or soil material change.
	Compaction Tests	Min. 2 per lift or every 20 Cubic Yards of material placed.
Liner	Field Seam Test	Beginning of each seaming period and at least once each 4 hours, for each seaming apparatus and personnel used that day.
	Non-Destructive Seam Test	1 per field seam.
	Destructive Seam Test	1 per 500-feet of seam
Anchor Trench	Compaction Tests	One test per lift per trench
Asphalt	Temperature	One Per Truck

All testing must be performed in accordance with the American Society for Testing ad Materials (ASTM)

The extraction well pump will be integrated into the existing wastewater treatment system using a series of floats to control pump on and pump off. These floats will be installed in the existing influent wastewater holding tank.

The pumps will be protected from running dry through the installation of a pressure transducer in the pipeline. The pressure transducer will register a change in pipe pressure, due to the movement of water within the pipeline. The control panel will contain logic such that if in the event that the pump is called to run and a pressure increase isn't observed in a specified period of time that the pump will automatically shutdown and provide an alarm signal indicating a problem. The control panel will also be configured such that in the event that the pump is running and that a pressure decrease to zero is observed for a specified period of time, that the panel will shut off the pump and display an alarm signal.

An integrated timer will be installed in the control panel to allow the operator to set the time periods for which the extraction well pump can run. Currently it is planned that the pump is to run during facility off periods. The use of this timer will minimize the use of the extraction well water to dilute the existing industrial wastewater being generated by the facility.

A flow meter will also be installed in the control panel to provide a record of flow pumped to the treatment system.

APPENDIX C

STATE STANDARDS, CRITERIA AND GUIDELINES (SCGS) INDEX

Copies to staff 7/31/95

COPY

New York State Department of Environmental Conservation

MEMORANDUM

TO: Regional Hazardous Waste Remediation Engineers, Bureau Directors and Section Chiefs
FROM: Michael J. O'Toole, Jr., Director, Division of Hazardous Waste Remediation
SUBJECT: Revised Index of New York State Standards, Criteria and Guidelines (SCGs)

DATE: JUL 29 1995

Attached please find a copy of the revised New York State Standards, Criteria and Guidelines (equivalent to ARARs) index. The Standards, Criteria and Guidelines (SCGs) listed in the index should be obtained directly from the program unit that has issued the SCGs. Also attached is a list of SCGs in tabular form that can be used as quick reference.

Major changes in this revision are the inclusion of:

1. The Division of Hazardous Substances Regulation's TAGM #3028 titled, "Contained-in Criteria for Environmental Media."

2. The DHWR's TAGM on Interim Remedial Measures.

3. The Division of Water's Technical and Operations Guidance Series (TOGs) 1.1.2 titled, "Groundwater Effluent Limitations" and TOGs 1.3.8 titled, "New Discharges to POTWs."

4. The Division of Fish and Wildlife's technical guidance for screening contaminated sediments.

5. Federal (USEPA, U.S. Army Corps of Engineers, OSHA/PESH and U.S.) requirements.

If you have any questions, please feel free to contact Mr. Ajay Shroff, of my staff, at (518)485-8792.

Attachment

INDEX
NEW YORK STATE SCGs

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

- Division of Solid Waste

-*6 NYCRR Part 360 - Solid Waste Management Facilities (effective October 9, 1993)

- Division of Hazardous Substances Regulation

-*6 NYCRR Part 370 - Hazardous Waste Management System: General (revised January 14, 1995)

Part 371 - Identification and Listing of Hazardous Wastes (revised January 14, 1995)

Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (revised January 14, 1995)

- 6 NYCRR Subpart 373-1 - Hazardous Waste Treatment, Storage and Disposal Facility Permitting Requirements (revised January 14, 1995)

373-2 - Final Status Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities (revised January 14, 1995)

373-3 - Interim Status Standards for Owners and Operators of Hazardous Waste Facilities (revised January 14, 1995)

373-4 - Facility Standards for the Collection of Household Hazardous Waste and Hazardous Waste from Conditionally Exempt Small Quantity Generators (January 14, 1995)

- 6 NYCRR Subpart 374-1 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities (revised January 14, 1995)

- 6 NYCRR Subpart 374-2 - Standards for the Management of Used Oil (January 14, 1995)

- 6 NYCRR Part 376 - Land Disposal Restrictions (January 14, 1995)

-**Technical and Administrative Guidance Memorandum (TAGM) 3028 - "Contained-In" Criteria for Environmental Media (November 1992)

- Division of Hazardous Waste Remediation

- 6 NYCRR Part 375 - Inactive Hazardous Waste Disposal Site Remedial Program (May 1992).

*revised ** newly added

- Division of Air

-6 NYCRR Part 200 (200.6) -	General Provisions (Revised January 29, 1993)
-6 NYCRR Part 201 -	Permits and Certificates (Revised March 31, 1993)
-6 NYCRR Part 211 (211.1) -	General Prohibitions
-6 NYCRR Part 212 -	General Process Emission Courses
-**6 NYCRR Part 227 -	Stationary Combustion Installations
-**6 NYCRR Part 231 -	New Source Review in Nonattainment Areas and Ozone Transport Regions
- 6 NYCRR Part 257 -	Air Quality Standards
- Air Guide 1 -	Guidelines for the Control of Toxic Ambient Air Contaminants

- Division of Spills Management
  - Spill Technology and Remediation Series (STARS)
    Memo #1, August 1992 - Petroleum-Contaminated Soil Guidance Policy

- Division of Fish and Wildlife
  - 6 NYCRR Part 608 - Use and Protection of Waters
  - 6 NYCRR Part 662 - Freshwater Wetlands - Interim Permits
    663 - Freshwater Wetlands Permit Requirements
    664 - Freshwater Wetlands Maps and Classifications
    665 - Local Government Implementation of the Freshwater Wetlands Act and Statewide Minimum Land - Use Regulations for Freshwater Wetlands
    **666 - Administration and Management of the Wild, Scenic and Recreational Rivers System in New York State Excepting the Adirondack Park
  - 6 NYCRR Part 182 - Endangered and Threatened Species of Fish and Wildlife
  - ECL Article 24 and Article 71, Title 23 - Freshwater Wetlands Act

** Technical Guidance for Screening Contaminated Sediments. (July 1994, same document as dated November 1993)

* revised ** newly added

** Fish & Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA). (October 1994)

** Freshwater Wetlands Regulations, Guidelines on Compensatory Mitigation. (October 1993)

** Niagara River Biota Contamination Project: Fish Flesh Criteria for Piscivorous Wildlife. (July 1987)

Division of Regulatory Affairs
- 6 NYCRR Part 361 - Siting of Industrial Hazardous Waste Facilities
- 6 NYCRR Part 364 - Waste Transporter Permits (revised January 12, 1990)
- Article 27, Title II of the ECL - Industrial Siting Hazardous Waste Facilities
- 6 NYCRR Part 621 - Uniform Procedures
- 6 NYCRR Part 624 - Permit Hearing Procedures

Division of Marine Resource, Bureau of Marine Habitat Protection
- Chapter 10 of 6 NYCRR Part 661 Tidal Wetlands - Land Use Regulations

Division of Mineral Resources
- Article 23, Title 27 - NYS Mined Land Reclamation Law
** - Article 23, and Article 71, Title 13-oil, Gas and Solution Mining Law

- 6 NYCRR Part
- 420 - General
- 421 - Permits
- 422 - Mined Land - Use Plan
- 423 - Reclamation Bond
- 424 - Enforcement
- 425 - Civil Penalties
** 550 - Promulgations and Enforcement of Rules and Regs.
** 551 - Reports and Financial Security
** 552 - Permits to Drill, Deepen, Plug Back or Convert Wells
** 553 - Well Spacing
** 554 - Drilling Practices and Reports
** 555 - Plugging and Abandonment
** 556 - Operating Practices
** 557 - Secondary Recovery and Pressure Maintenance
** 558 - Transportation
** 559 - "Bass Island" Regulations

* revised ** newly added

NEW YORK STATE SCGs (cont'd)

**FEDERAL REQUIREMENTS

US ENVIRONMENTAL PROTECTION AGENCY

- Guidance on Residential Lead-Based Paint, Lead-Contain Contaminated Soil, July 14, 1994

- 16 USC 661 - Fish and Wildlife Coordination Act
- Risk Assessment Guidance for Superfund - Volume 1 - Human H December 1989
- 40 CFR Part 60 Subpart WWW: Standards of Performance f Landfills; December 1994
- 40 CFR Part 280; Guidelines for Specifications of disposal Material

US ARMY CORPS OF ENGINEERS

- Executive Order 11990 - Protection of Wetlands; May 1977
- 33 USC 466 Section 404 - Clean Water Act
- 33 CFR Parts 320-330; Regulatory Programs of the Corps of

OSHA/PESH

- 29 CFR Part 1910.120; Hazardous Waste Operations and Eme

US

- 16 USC 470 - National Historic Preservation Act

STANDARDS, CRITERIA, & GUIDANCE

Div./ Agcy.*	Title	Std./ Guid.	Requirements
BMHP	6 NYCRR Part 661 (Cp. 10) - Tidal Wetlands Land Use Regulations	S	▸ limit/preclude excavation, filling, regrading in vegetated tidal wetlands or portions of adjacent areas
DAM	1 NYCRR Part 371 - Notice of Intent	S	▸ filing necessary if impact > 10 acres within an agricultural district
DAR	Air Guide 1 - Guidelines for the Control of Toxic Ambient Air Contaminants	G	▸ control of toxic air contaminants ▸ screening analysis for ambient air impacts ▸ toxicity classifications ▸ ambient standards - short term/annual
DAR	6 NYCRR Part 200 (200.6) - General Provisions; 1/29/93	S	▸ prohibits contravention of AAQS or causes air pollution
DAR	6 NYCRR Part 201 - Permits & Certificates; 3/31/93	S	▸ prohibits construction/operation w/o permit/certificate
DAR	6 NYCRR Part 211 (211.1) - General Prohibitions	S	▸ prohibits emissions which are injurious to human, plant, or animal life or causes a nuisance
DAR	6 NYCRR Part 212 - General Process Emission Sources	S	▸ establishes control requirements
DAR	6 NYCRR Part 227 - Stationary Combustion Installations	S	▸ requirement for stationary combustion installations
DAR	6 NYCRR Part 231 - new source review in non-attainment areas and ozone transport regions	S	▸ requirements for non-attainment areas and ozone transport regions
DAR	6 NYCRR Part 257 - Air Quality Standards	S	▸ applicable air quality standards
DFW	Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA); 10/94	G	▸ habitat assessments ▸ contaminant impact assessments ▸ ecological effects of remedies ▸ remedial requirements ▸ monitoring ▸ checklist
DFW	ECL Article 24 & Article 71, Title 23 - Freshwater Wetlands Act	S	▸ preserve, protect, and conserve freshwater wetlands ▸ regulate use and development
DFW	6 NYCRR Part 182 - Endangered & Threatened Species of Fish & Wildlife	S	▸ lists endangered, threatened species and species of special concern and prohibits taking except under permit
DFW	6 NYCRR Part 608 - Use and Protection of Waters	S	▸ protect certain classified streams ▸ permits for impoundments, structures, dredge, and fill

DFW	6 NYCRR Part 662 - Freshwater Wetlands - Interim Permits	S	▸ interim permits in areas prior to DECs filing of a final freshwater wetlands map
DFW	6 NYCRR Part 663 - Freshwater Wetlands Permit Requirements	S	▸ procedural requirements for various activities in wetlands and adjacent areas and standards for permit issuance
DFW	6 NYCRR Part 666 - Administration and Management of the Wild, Scenic and Recreational Rivers System in New York State Excepting the Adirondack Park	S	▸ procedural requirements for administration and management of the wild, scenic and recreational rivers
DFW	Technical guidance for screening contaminated sediments; 7/94	G	▸ sediments screening levels
DFW	Freshwater Wetlands Regulations-Guidelines on Compensatory Mitigation; 10/93	G	▸ Guidance on compensatory mitigation of freshwater wetlands
DFW	Niagara River Biota Contamination Project - Fish Flesh Criteria for Piscivorous Wildlife; 7/87	G	▸ Fish Flesh Criteria - Niagara river biota study
DFW	6 NYCRR Part 665 - Local Government Implementation of the Freshwater Wetlands Act & Statewide Minimum Land - Use Regulations for Freshwater Wetlands	S	▸ provides for optional local regulatory authority regarding use and development of freshwater wetlands
DHSR	TAGM 3028 "Contained In" Criteria for Environmental Media; 11/92	G	▸ Soil Action Levels
DRA	6 NYCRR Part 364 - Waste Transporter Permits; 1/12/90	S	▸ regulates collection, transport, and delivery of regulated waste
DHSR	6 NYCRR Part 370 - Hazardous Waste Management System: General; 1/14/95	S	▸ definitions of terms and general standards applicable to Parts 370-374 & 376
DHSR	6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes; 1/14/95	S	▸ haz. waste determinations
DHSR	6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities; 1/14/95	S	▸ manifest system and record keeping, certain management standards
DHSR	6 NYCRR Subpart 374-1 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities - 1/14/95	S	▸ requirements for recyclable materials, hazardous waste burned for energy recovery, used oil burned for energy recovery, precious metal recovery, spent lead acid battery reclamation
DHSR	6 NYCRR Part 376 - Land Disposal Restrictions - 1/14/95	S	▸ identifies hazardous waste restricted from land disposal defines land disposal

DHSR	6 NYCRR Subpart 373-1 - Hazardous Waste Treatment, Storage and Disposal Facility Permitting Requirements; 1/14/95	S	▸ hazardous waste permitting requirements: includes substantive requirements
DHSR	6 NYCRR Subpart 373-2 - Final Status Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities; 1/14/95	S	▸ hazardous waste management standards e.g., contingency plan; releases from SWMUs; closure/post-closure; container/management; tank management; surface impoundments; waste piles; landfills; incinerators; etc.
DHSR	6 NYCRR Subpart 373-3 - Interim Status Standards for Owners and Operators of Hazardous Waste Facilities - 1/14/95	S	▸ similar to 373-2
DHSR	6 NYCRR Subpart 373-4 - Facility Standards for the collection of household hazardous waste and hazardous waste from conditionally exempt small quantity generators; 1/14/95	S	▸ hazardous waste management standards collection of household hazardous waste ▸ hazardous waste from cond. except small quantity generators
DHWR	TAGM HWR-92-4046 Determination of Soil Cleanup Objectives and Cleanup Levels; 1/24/94	G	▸ soil cleanup goals
DHWR	TAGM HWR-92-4030 Selection of Remedial Actions at Inactive Hazardous Waste Sites; 5/90	G	▸ remedy selection criteria/evaluations
DHWR	TAGM HWR-94-4027 - Assistance for Contaminated Private and Public Water Supplies; 4/18/94	G	▸ when DEC can supply potable water
DHWR	TAGM HWR-89-4031 Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites; 10/27/89	G	▸ dust suppression during IRM/RA
DHWR	TAGM HWR-92-4042 Interim Remedial Measures; 6/1/92	G	▸ define and track IRMs
DHWR	TAGM HWR-92-4048 Interim Remedial Measures - Procedures; 12/9/92	G	▸ identifying and implementing IRMs
DHWR	6 NYCRR Part 375 - Inactive Hazardous Waste Disposal Site Remedial Program; 5/92	S	▸ requirements regarding remedial programs ▸ private party programs, state funded programs, state assistance to municipalities
DMR	Title 27 - NYS Mined Land Reclamation Law	S	▸ permit required for mining > 1000 tons in < 12 months (e.g. clay for cover)
DMR	6 NYCRR Part 420 - General	S	▸ definitions and scope
DMR	6 NYCRR-- Part 421 - Permits	S	▸ requirements for mining permits

DMR	6 NYCRR Part 422 - Mined Land - Use Plan	S	▸ mining and reclamation plans
DMR	6 NYCRR Part 423 - Reclamation Bond	S	▸ requirements for reclamation bonds
DMR	6 NYCRR Part 424 - Enforcement	S	▸ violations of mining regulations
DMR	6 NYCRR Part 425 - Civil Penalties	S	▸ assessing penalties
DMR	6 NYCRR Part 426 - Hearings	S	▸ hearings regarding mining permits/penalties
DMR	6 NYCRR Part 550- Promulgations and Enforcement of Rules and Regs.	S	▸ Promulgations and enforcement of the mining rules and regs.
DMW	6 NYCRR Part 551 - Reports and Financial Security	S	▸ mining related reports and requirements for financial security
DMR	6 NYCRR Part 552 - Permits to drill, deepen, plug back or convert wells	S	▸ permit requirements of various mining operations
DMR	6 NYCRR Part 553 - Well Spacing	S	▸ requirements on well spacing
DMR	6 NYCRR Part 554 - Drilling Practices and Reports	S	▸ various drilling practices
DMR	6 NYCRR Part 555 - Plugging and Abandonment	S	▸ procedural requirements for plugging and abandonment
DMR	6 NYCRR Part 556 - Operating Practices	S	▸ various operating methods
DMR	6 NYCRR Part 557 - Secondary Recovery and Pressure Maintenance	S	▸ various methods for secondary recovery and pressure maintenance
DMR	6 NYCRR Part 558 - Transportation	S	▸ transportation methods
DMR	6 NYCRR Part 559 - "Bass Island" Regulations	S	▸ regulations related to "Bass Island"
DMR	Article 23 and Article 71, Title 13 - Oil, Gas and Solution Mining Law	S	▸ procedural requirements for oil, gas, and solution mining
DOH	Appendix 5-B of Part 5 of the State Sanitary Code (Rural Water Supply)	S	▸ requirements for wells, springs, cisterns, etc. in rural areas
DOH	The Binghampton State Office Building cleanup criteria for PCDDs, PCDFS & PCBs	G	▸ building cleanup criteria
DOH	The 10 ppt criterion for 2,3,7,8-TCDD in fish flesh	C	▸ < 10 ppt in fish flesh
DOH	Tolerance levels for EDB in food	G	▸ possible use in risk assessments
DOH	Criteria for the development of health advisories for sport fish consumption	G	▸ for use in risk assessments and for known problems

DOH	Part 16 draft limits on the disposal of radioactive materials into sewer systems	G	▸ discharge to sewers of radioactive materials
DOH	NYSDOH Interim Report on Point-of-Use Activated Carbon Treatment Systems	G	▸ guidance on the use of activated carbon treatment systems for drinking water
DOH	Appendix 5-A of Part 5 of the State Sanitary code (Recommended Standards for Water Works)	S	▸ standards for construction/operation of public water systems
DOH	Part 170 of title 10 of the NYCRR, Water Supply Sources	S	▸ protecting public water supplies
DOH	Part 5 of the State Sanitary Code, Drinking Water Supplies; 3/11/92	S	▸ drinking water standards
DOH	NYSDOH PWS 68 - Blending Policy for Use of Sources of Drinking Water	G	▸ conditions under which blending is allowed
DOH	NYSDOH PWS 69 - Organic Chemical Action Steps for Drinking Water	G	▸ actions to take when the concentration of organic contaminants exceed specified levels in a public water system
DOH	NYSDOH PWS 152 - Procedure for Handling Community Water System Emergencies	G	▸ identifies emergencies and what steps to take at public water systems
DOH	NYSDOH PWS 159 - Responding to Organic Chemical Concerns at Public Water Systems	G	▸ steps to take when organic chemical concentrations exceed action levels
DOH	NYSDOH PWS 160 - Public Notification of Organic Chemical Incidents Regarding Public Water Supplies	G	▸ requirements for notifying users
DOL	12 NYCRR 38 - Ionizing Radiation Protection	S	▸ protection and licensing requirements for handling materials that produce ionizing radiation
DOL	12 NYCRR 50 - Lasers	S	▸ laser users must have a certificate of competence licensed land surveyors excepted
DOS	Federal Consistency Process	G	▸ federal "actions" must be consistent with the NYS coastal management program
DOS	State Consistency Process	G	▸ proposed "actions" in the coastal area must be evaluated to determine consistency with NYS coastal policies. If action may have a significant effect, must prepare an EIS. Dept. of State must approve a Certificate of Consistency.
DOS	State Costal Policies	G	▸ 44 policies regarding development, fish & wildlife, recreation, energy & ice management, water/air resources, etc.

DOW	TOGS 1.1.2 - Groundwater Effluent Limitations; 8/94	G	▸ guidance for developing effluent limits for groundwater
DOW	6 NYCRR Part 702-15(a), (b), (c), (d) & (e) -	S	▸ Empowers DEC to Apply and Enforce Guidance where there is no Promulgated Standard
DOW	6 NYCRR Part 700-705 - NYSDEC Water Quality Regulations for Surface Waters and Groundwater; 9/1/91	S	▸ 700 - Definitions, Samples and Tests; 701 - Classifications Surface Waters and Groundwaters; 702 - Derivation and Use of Standards and Guidance Values; 703 - Surface Water and Groundwater Quality Standards and Groundwater Effluent Standards;
DOW	6 NYCRR Part 750-757 - Implementation of NPDES Program in NYS	S	▸ regulations regarding the SPDES program
DRA	Article 27, Title II of the ECL - Industrial Siting Hazardous Waste Facilities	S	▸ enabling statute; must be used with Part 361
DRA	6 NYCRR Part 364 - Waste Transporter Permits; 1/12/90	S	▸ regulates collection, transport, and delivery of regulated waste
DRA	6 NYCRR Part 621 - Uniform Procedures	S	▸ permit processing requirements
DRA	6 NYCRR Part 624 - Permit Hearing Procedures	S	▸ procedures for hearings to resolve permit issues
DSM	STARS #1 - Petroleum-Contaminated Soil Guidance Policy; 8/92	G	▸ remedial guidance for petroleum spill cleanups
DSW	6 NYCRR Part 360 - Solid Waste Management Facilities; 10/9/93	S	▸ solid waste management facility requirements landfill closures; C&D landfill requirements; used oil; medical waste; etc.
OSHA/ PESH	29 CFR Part 1910.120; Hazardous Waste Operations and Emergency Response	S	▸ health and safety
US	16 USC 470 - National Historic Preservation Act	S	▸ determine if site may have significance mitigate impacts
USACE	Executive Order 11990 - Protection of Wetlands; 5/24/77	G	▸ minimize destruction, loss, or degradation of wetlands
USACE	33 USC 466 Section 404- Clean Water Act	S	▸ control disturbances in wetlands
USACE	33 CFR Parts 320-330; Regulatory Programs of the Corps of Engineers	S	▸ wetlands permits
USEPA	Hydrologic Evaluation of Landfill Performance (HELP) Model Hydrologic Simulation of Solid Waste Disposal Sites	G	▸ cover system performance/hydrology

DOS	Federal Register - Part V - Department of Commerce - Federal Consistency Regulation; 6/25/79	G	▸ impacts federal actions (e.g. NP zone
DOS	Part 600 - Department of State, Waterfront Revitalization and Coastal Resources Act	S	▸ "Coastal Area" includes Lakes I St. Lawrence and Niagara river south of the federal dam at Troy Harlem river, the Kill van Kull Island sound, and the Atlantic oc
DOS	NYS Costal Management Program	G	▸ program summary: promote the resources; protect coastal resour activities.
DOW	Analytical Services Protocols (ASP); 11/91	G	▸ analytical procedures
DOW	TOGS 2.1.2 - Underground Injection/Recirculation (UIR) at Groundwater Remediation Sites; 7/90	G	▸ guidance of the applicability of S groundwater effluent standards t remediation measure
DOW	TOGS 1.3.8 - New Discharges to Publicly Owned Treatment Works; 10/26/94	G	▸ limits on new or changed discha requirements regarding bioaccur substances plus other considerati
DOW	TOGS 1.3.7 - Analytical Detectability & Quantitation Guidelines for Selected Environmental Parameters; 7/90	G	▸ guidance on selection of analytic quantitation limits in SPDES per
DOW	TOGS 1.3.4.a - BPJ Methodologies/Amendments; 11/3/88	G	▸ amends TOGS 1.3.4 regarding I
DOW	TOGS 1.3.4 - BPJ Methodologies; 4/1/87	G	▸ guidance for the application of B determination of effluent limits
DOW	TOGS 1.3.2 - Toxicity Testing in the SPDES Permit Program; 5/90	G	▸ procedures for when effluent tox required
DOW	TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values; 10/93	G	▸ compilation of ambient water qu guidance values
DOW	TOGS 1.3.1C - Development of Water Quality Based Effluent Limits for Metals Amendment; 8/91	G	▸ as stated
DOW	TOGS 1.3.1 - Waste Assimilative Capacity Analysis & Allocation for Setting Water Quality Based Effluent Limits; 5/90	G	▸ guidance for determining maxin and corresponding effluent limit to surface water
DOW	TOGS 1.2.1 -Industrial SPDES Permit Drafting Strategy for Surface Waters; 4/90	G	▸ guidance for developing effluent for point source releases to surfa
DOW	TOGS 2.1.3 - Primary & Principal Aquifer Determinations; 10/90	G	▸ clarifies the meaning of "primary aquifer" and "principal aquifer."

USEPA	Solidification/Stabilization and its Application to Waste Materials; 6/93	G	▸ soil treatment
USEPA	16 USC 661 - Fish and Wildlife Coordination Act	S	▸ mitigate impacts to wetlands
USEPA	Integrated Risk Information System (IRIS)	G	▸ verified RfDs and cancer slope factors
USEPA	Risk Assessment Guidance for Superfund - Volume I - Human Health Evaluation Manual; 12/89	G	▸ human health risk assessments
USEPA	40 CFR Part 60 Subpart WWW: Standards of Performance for Municipal Solid Waste Landfills; 12/94	S	▸ landfill gas collection/treatment
USEPA	40 CFR Part 280; Guidelines for Specifications of Disposal Sites for Dredged or Fill Material	G	▸ restoration of wetlands
USEPA	40 CFR Part 761; Toxic Substances Control Act	S	▸ PCB disposal and management Spill Response Policy
USEPA	Guidance on Residential Lead-Based Paint, Lead Contaminated Dust and Lean Contaminated Soil; 7/94	G	▸ soil cleanup guidance for lead-contaminated media

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BMHP: Division of Marine Resources, Bureau of Marine Habitat Protection
DAM: Department of Agriculture and Markets
DAR: Division of Air Resources
DFW: Division of Fish and Wildlife
DHSR: Division of Hazardous Substances Regulation
DHWR: Division of Hazardous Waste Remediation
DMR: Division of Mineral Resources
DOH: Department of Health
DOL: Department of Law
DOS: Department of State
DOW: Division of Water
DRA: Division of Regulatory Affairs
DSM: Division of Spills Management
DSW: Division of Solid Waste
USEPA: US Environmental Protection Agency
USSACE: US Army Corps of Engineers

APPENDIX D

HEALTH AND SAFETY PLAN

Prepared: August 21, 2003

Astro Electroplating, Inc.
170 Central Avenue
Farmingdale, NY

SITE SPECIFIC ENVIRONMENTAL HEALTH AND SAFETY PLAN

PROJECT LOCATION: **Astro Electroplating, Inc. Inactive Hazardous Waste Disposal Site located at 170 Central Avenue, Farmingdale, New York.**

PROJECT DESCRIPTION: **Implementation of the remedial design plan to conform to the USEPA standard operating safety guide (USEPA, 1988) and US Department of Labor, OHSA Standards 29CFR Part 1910.**

Written by:

TWO GROUP SAFETY NET
[illegible]
Babylon, NY 11702-0043
CSP#1269

Frank D. Clark, President
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Frank D Clark

A. ***SITE SPECIFIC INFORMATION:***

Owner Representative – Nelson, Pope & Voorhis llc.
Engineer – Telephone #

Site Safety Officer – Telephone #

Field Coordinator (on-site Supervisor) –
Telephone #

TABLE OF CONTENTS

1.0 RESPONSIBILITIES:

The Department of Labor Occupational Safety and Health Administration (OSHA), requires that employer establish a chain of command and overall responsibilities of management supervisors and employees be established. The safety and health of employees is the responsibility of the Project Engineer and is assisted by the Field Coordinator (on-site Supervisor) and the Site Safety Officer.

1.1 AUTHORIZED PERSONNEL:

A list of authorized personnel to the Astro Electroplating, Inc facilities will be compiled and maintained at the site. This specific list will be copied on a daily basis and hand delivered to the site management. All authorized Astro Electroplating Inc. and Nelson, Pope & Voorhis Engineering Contractor and subcontractor personnel shall meet the requirements of this Site Specific Environmental Health and Safety Plan.

1.2 PROJECT MANAGER:

The Project Engineer is responsible for ensuring that all work performed is in accordance with the contractual agreement with client, Astro Electroplating, Inc in compliance with the applicable rules, regulations and standards, in a safe and productive manner. The on-site Supervisor (field coordinator) will ensure that the work crews have adequate equipment and supplies to effectively perform field activities, and insure the required (PPE) Personal Protective Equipment are in use and the company's Safety and Health Program is being followed.

He shall ensure that we are in compliance with USEPA and Department of Labor OSHA Standards, and Company requirements are being followed. The Project Engineer, assisted by the on-site Supervisor and the Site Safety Officer shall enforce appropriate disciplinary action whenever unsafe practices occur.

1.3 PROJECT ENGINEER:

The Project Engineer on telephone no. _____ is responsible to ensure work is performed in compliance with required specifications found in the contractual agreement. He has the overall responsibility to ensure a safe and productive operation.

1.4 On-Site Supervisor (Field Coordinator):

_____at telephone_____will directly supervise the work force and make a constant and sincere effort to gain and maintain the employees cooperation. The On-Site Supervisor (field coordinator) is responsible for conducting weekly documented safety talks and meetings. See Attachment A. His/Her other responsibilities are to conduct job site inspections, accident investigations and complete the accident reports as follows: Industrial Injury Inv. Report, Attachment C, Vehicle Accident Report, Attachment B, and Guidelines for Letter of Explanation, Attachment D.

1.5 SAFETY AND HEALTH/SITE SAFETY OFFICER:

The On-Site Safety Officer shall assist the On-Site Supervisor (Field Coordinator) and Project Engineer in determining and selecting safety equipment, protective equipment and appropriate training programs.

The Site Safety Officer shall perform site random audits to help determine that all aspects of the Site Specific Environmental Health and Safety Plan are being followed and carried out in a safe and healthy manner.

2.0 PURPOSE:

The Site Specific Plan provides guidance to Astro Electroplating, Inc and Nelson, Pope & Voorhis, llc and subcontractor employees conducting site work at Astro Electroplating Inactive Hazardous Waste Disposal Site located at 170 Central Avenue, Farmingdale, NY. The plan discusses potential chemical and physical hazards anticipated at the site and describes the control measures to assure personnel safety.

Enclosed please find the Generic Material Safety Data Sheets of petroleum or chemical based materials to be handled by employees. All employees will be instructed in the safe use and handling of these chemicals and copies of the MSDS will be at the site for employee references and instruction. The client, Astro Electroplating, Inc, shall be made aware in writing of any changes or modifications to this plan.

2.1 DISTRIBUTION:

The Project Engineer shall be responsible for making a copy of this plan available to client personnel, as well as Astro Electroplating, Inc and subcontractor employees. As the project commences, it is the responsibility of the management to possibly take more stringent safety and health measures thus detailed in this plan.

All employees assigned to this project, shall read this Site Specific Environmental Health and Safety Plan and acknowledge in writing by signing the attached form, his/her understanding of the plan requirements.

The Nelson, Pope & Voorhis, llc, owner representative, and subcontractors shall provide all supervision, labor, equipment necessary for the completion of this project. Work shall be performed in strict accordance with Specifications USEPA Standard Operating Safety Guide, USEPA 1988 with all written Federal, State, and Local regulations.

3.0 GENERAL SAFETY RULES AND REGULATIONS:

Safety Policy Statement – All personnel on site are expected to conduct themselves and act in a manner so as to minimize the potential for accidents. All site management, are responsible for assuring that personnel under their direct supervision are aware of safe work rules and procedures. All job personnel are required to follow all Federal, State and Local Environmental Health and Safety Rules and Regulations.

Violations of established safety and health requirements may result in disciplinary action, up to and including termination of employment by Astro Electroplating, Inc and its owner representative – Nelson, Pope & Voorhis, llc. Personnel are encouraged to communicate safety concerns to management and work as a team to prevent injuries to fellow workers and property loss.

Daily Site Procedures by Management:

- **At site arrival, meet with Astro Electroplating Representative and representatives of all subcontractors.**
- **Review the day's job requirements (safety, schedule, progress, etc.).**

- Conduct pre-work briefing to employees and subcontractor employees.
- Commence work activities, mobilize equipment and manpower.

The On-Site Supervisor (field coordinator) is responsible for conducting a daily safety briefing (i.e. tailgate safety meetings) with all personnel. The daily safety briefing will occur at the beginning of the shift when daily assignments and project details are discussed. The daily safety briefings will review pertinent safety issues that may occur over the shift's work and review results of safety inspections and accident investigations, including near miss occurrences.

Number of briefings: If the work or operations to be performed during the workday are repetitive and similar, at least one (1) job briefing shall be conducted before the start of the first job of each day. Additional job briefings shall be held if significant changes, which might affect the safety of the employees during the course of the work.

4.0 ACCIDENT REPORTING:

Accidents or near misses shall be investigated and documented by the Site Safety Coordinator or in his absence the Site Supervisor (field coordinator). Completed reports shall be submitted to the Project Engineer for processing to the company representative. Injured employees must be provided immediate first aid by a qualified person and taken to the nearest medical facilities as required.

If emergency services are required, such as an ambulance, notification must be made to the Site Safety Coordinator or Site Supervisor (field coordinator) and the Project Engineer of Nelson, Pope & Voorhis, llc. Sample of the Occupational Safety and Health Administration injury Report OSHA 301, Attachment C; Vehicle Accident Investigation Report, Attachment B; Guidelines for Completing the Letter of Explanation, Attachment D; and Emergency Response Table, Attachment H are attached.

All accidents that require medical treatment, restricted work activity, lost time or hospitalization or death shall be recorded on the OSHA 300 Injury/Illness Log, Attachment E.

Astro Electroplating, Inc and Nelson, Pope & Voorhis, llc have not received an OSHA citation in the passed five (5) years.

5.0 EMPLOYEE TRAINING AND ORIENTATION:

The On-Site Supervisor (field coordinator) will review pertinent sections of this Site Specific Environmental Health & Safety Plan with employees. All personnel will be made aware of the Environmental Health and Safety hazards and appropriate protective measures prior to start-up. The Competent Person, and Site Safety Officer, has the proper accreditation and experience in construction safety. In addition, he is a qualified CPR and first-aider. Employees assigned to this project have received prior safety training and are trained/qualified mechanics from the specific trade unions. All employees engaged in the remediation work are 40-hour Hazwopper trained and are approved to wear respiratory protection. Daily job site briefings shall be made by the Site Supervisor to ensure a safe and productive work force.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE):

Personal Protective Equipment is important to an effective safety program when specific protective equipment is required for certain work assignment, they will be worn. No Astro Electroplating, Inc or Nelson, Pope & Voorhis, llc employees or subcontractor employees will be allowed on a work site without all the required Personal Protective Equipment.

6.1 ENVIRONMENTAL SUBCONTRACTOR(S):

Astro Electroplating, Inc, will require that all subcontractors conform to our Environmental Health & Safety Site Specific Plan on PPE. Where work requires remediation activities such as the removal of contaminated soil or water, the PPE required will include the following:

1. **Chemical resistant disposable saran coveralls to include hood and booties.**
2. **Chemical resistant gloves (nitrile).**
3. **Hard Hat**
4. **Safety Shoes, Rubber Boots**
5. **Safety Glasses**
6. **Hearing Protection as required.**

All contaminated PPE will be disposed of in approved waste containers and properly manifested as required by Astro Electroplating, Inc, Local, State and Federal Regulations.

6.2 UNDER NON-REMEDIATION ACTIVITIES PERSONAL PROTECTIVE EQUIPMENT IS AS FOLLOWS:

- Hard Hats shall be worn at all times.
- Eye and Face Protection – safety glasses with side shields and face shields shall be worn by employees when there is a potential chance of injury due to grinding, chipping and drilling. During soil handling chemical goggles would be recommended where there is potential generation of dust.
- Safety Shoes with 6-inch tops are required and must be worn by all employees with the potential for foot injuries.
- All other activities, suitable work clothing is required such as long sleeve shirt and pants. Employees shall avoid wearing oily or greasy clothing that constitute a fire hazard and is not good safe hygiene practices.
- When exposure to noise levels in excess of 85db or where operating specific tools. Employees shall wear their earplugs or muffs.
- Wearing of inner and outer gloves for rough or sharp objects or materials, chemical handling, handling tools and other materials that may cut, abrade or irritate the skin. Gloves shall be taped at the wrist the tyvek coveralls.
- Personnel performing flame cutting or welding shall wear welding shields or goggles. In addition to shields and goggles, employees are required to wear FR rated coveralls and leather protectors and ankle spats as may be necessary.
- Traffic safety vests are required by all employees engaged in street surface activity with exposure to vehicle traffic.

Astro Electroplating, Inc, is committed to provide the best possible protection to each employee and subcontractor employees. We will only purchase PPE that meets or exceeds the American national Standards Institute for testing. Our guidelines are established and in compliance with the Occupational Safety and Health Act OSHA, ANSI:

☐ **29CFR 1910.132**	**Hazard Assessment (PPE)**
☐ **29CFR 1910.133 ANSI Z87.1 1989**	**Eye and Face Devices**
☐ **29CFR 1910.134, NOISH National Institute for Occupational Safety & Health Under Provisions of 30CFR Part II ANSI Z88.2 1969**	**Respiratory Protection**
☐ **29CFR 1910.135, ANSI Z89.1-1986**	**Protective Helmets (Hard Hats)**
☐ **29CFR 1910.136, ANSI Z41-1991**	**Protective Footwear**
☐ **29CFR 1910.138**	**Hand Protection**

6.3 Respiratory Protection Program:

The minimum protection if necessary as determined by personal monitoring is a half (1/2) face reusable mask with combination cartridge filtration HEPA – acid gas and organic vapor.

7.0 HAZARD ASSESSMENT AND SELECTION OF PERSONAL PROTECTIVE EQUIPMENT:

ACTIVITY	HAZARD	PPE/EQUIPMENT
Job Setup	Slips – Trips – Falls	Hard Hats, Safety Glasses, Work Gloves, Steel Toe Safety Shoe, Hearing Protection.
Excavation/Trenching Remediation	Slips-Trips-Falls, Dermal Contact, Inhalation, Atmosphere conditions heat stress, cave-ins, confined space (enclosed space)	Hard Hat, Safety Glasses, Safety Shoes, Respirator (See Respiratory Section), Saran-Coated coveralls, Nitrile Gloves, Rubber Boots, Continuous Atmosphere testing multi-gas meter, Sheeting/Shoring, Hearing Protection.
Civil, Electrical, Mechanical Activities	Slips-Trips-Falls, Stored Energy, Atmosphere Conditions, Dermal Contact, Inhalation.	Hard Hat, Safety Glasses, Safety Shoes, Respirators (See Respiratory Section), Polycoated Tyveks, Rubber Boots, Work Gloves, Nitrile Gloves, Lockout/Tagout Energy Source, Continuous Atmosphere testing multi-gas meter, Hearing Protection.

Soil and Paving Restoration	Slips-Trips-Falls, Cave-ins.	Hard Hats, Safety Glasses, Safety Shoes, Respirator (See Respirator Section), Polycoated Tyveks, Rubber Boots, Work Gloves, Continuous Atmosphere Testing, Hearing Protection.

7.1 **EXPOSURE MONITORING:**

Under the standard, OSHA requires that during an assessment, if hazardous materials are present in the workplace, the employer is required to determine whether employee's exposure exceeds the action level. This must be determined by personnel monitoring employees in their breathing zone. Area monitoring is not considered employee exposure monitoring. Our work activities will require employees to enter excavations, etc. To ensure their safety, we will require personal monitoring to ensure personal protective equipment is adequate. OSHA requires this type of assessment be conducted at minimum annually of a work practice exposure and more frequent when entering areas such as confined spaces. During assessment, proper ventilation and respiratory protection must be in use. If monitoring indicates below the PEL 5ppm or below then respirators are not required.

8.0 **FIRST AID KITS/MEDICAL SUPPLIES AND ASSISTANCE:**

Adequate first aid supplies and equipment shall be at the work site and properly maintained and available to the designated trained first-aider.

At each work site there shall be a qualified first-aider to provide emergency assistance within four (4) minutes time. Notification for emergency assistance shall be made immediately to the following emergency numbers.

9.0 EMERGENCY RESPONSE AGENCIES AND CONTACTS:

Emergency Medical Services (EMS) -
When an ill or injured person(s) is in need of immediate medical assistance, call 911 from the nearest telephone. When calling 911 and requesting medical assistance from the Emergency Medical Service (EMS), the following steps must be applied to ensure that an ill or injured person(s) receives medical attention as quickly as possible:

- **The person who telephones 911 shall identify himself or herself by stating the location of the person in need of medical assistance, i.e., Astro Electroplating, Inc, 170 Central Avenue, Farmingdale, N.Y. Inactive Hazardous Waste Disposal Site.**
- **The person calling 911 shall meet the EMS at the entrance to the facility.**
- **The person(s) meeting the ambulance shall escort the ambulance to the person(s) in need of medical assistance.**

The emergency telephone number 911 is connected to the central police department located in Yaphank. After obtaining the information about the location and type of emergency, an ambulance service is dispatched from the local station. The local ambulance station for EMS in Farmingdale, New York, is located at the East Farmingdale Fire Department, 930 Conklin Street, Farmingdale, New York 11735. The address and telephone number is listed below. The telephone number at the hospital can also be called, in addition to 911, to expedite the service.

EMERGENCY MEDICAL – POLICE – FIRE:

LOCAL EMERGENCY CONTACT	PHONE NUMBER	LOCATION
EMERGENCY MEDICAL AMBULANCE (East Farmingdale Fire Department)	911	EMS is located at 930 Conklin Street, Farmingdale, NY 11735
POLICE Suffolk County	911	Yaphank, New York, 1st Precinct in North Lindenhurst on Route #109
FIRE DEPARTMENT	911	East Farmingdale Fire Department Headquarters, 930 Conklin Street, Farmingdale, N.Y.

MEDICAL EMERGENCY CONTACTS:

MEDICAL EMERGENCY CONTACTS	PHONE NUMBERS	LOCATION
Brunswick Hospital Center	516-789-7000	366 Broadway, Amityville, NY

10.0 DANGEROUS ENVIRONMENTS MANAGEMENT:

Vaults, manholes, excavations, trenches are classified as Confined Spaces/Enclosed Spaces. The OSHA Confined Space/Enclosed Space procedures as required will be followed if we are required to enter these spaces. We are required to have an on-site rescue team during all Confined Space Entries in IDLH atmospheres. They must be in readiness conditions. The rescue team will have a supervisor and minimum of two (2) employees qualified in rescue. These names must be placed on the confined space permit.

Specific Safety Requirements for Vaults/Manholes, Excavations, Trenches, Tanks:

- **Testing prior to entry for hazardous atmosphere. Minimum two tests per shift. The first test to be performed at the start of the shift and the second test should be performed mid-shift or additional test when re-entry is made. However, we will perform continuous monitoring using a multi-gas analyzer for the following gases and oxygen levels. Oxygen – Hydrogen Sulfide – Carbon Monoxide, Combustible Gases.**
- **Use of sufficient trained employees in confined spaces/enclosed spaces.**
- **Communication between personnel on the surface and personnel in the confined/enclosed spaces shall be maintained at all times.**
- **There will be a person designated at the surface to monitor operations at all times. Assuming no other duties but as the attendant.**
- **Availability of ANSI approved rescue equipment, harnesses, tripod and winch assembly in the event rescue is required for all vertical entries 5 or more feet.**
- **If ventilation is required, suggest using copious blower.**

- Vault or manhole covers, etc shall be removed during operations. Openings are to be provided with guards to prevent others from falling into them. Ladders for entry shall extend at least three (3) feet above the surface.
- Forced Ventilation shall be used for hot work (welding) and as deemed necessary for the safety of personnel. Material will be lowered and raised using ropes, with care being given to the employees, working in the vault or tank.
- Illumination will be provided in the vault or tank using lighting rated for hazardous atmospheres.
- All personnel must be properly trained in confined and enclosed space safety procedures before entering and working in confined spaces.

11.0 FIRE PROTECTION AND EXPLOSIVE HAZARD REVIEW:

Good housekeeping is essential to fire prevention. All areas on the job site will be kept free of combustible materials. Smoking will be prohibited in most areas especially in restricted zone (exclusive zone), decontamination zone (contaminant reduction zone). Astro Electroplating, Inc will maintain sufficient quantity of fire extinguishers at the site. Fire extinguisher type shall be dry-chemical type minimum 10lb capacity.

In the event of a fire, Astro Electroplating, Inc or General Contractor, Nelson, Pope & Voorhis, llc, will immediately notify the local Fire Department via 911. Astro Electroplating, Inc employees are familiar with the use of portable fire extinguishers. Fire extinguishers shall only be used by competent employees and only on the incipient stage fires. Smoking is prohibited at or in the vicinity of hazardous operations or flammable combustible materials. No smoking signs shall be adhered to in exclusive zone, contaminant reduction zone, smoking will be allowed only in designated areas and in the support zone (clean zone).

Flammable or combustible solvents shall not be used for cleaning purposes without specific instructions from the site supervisor or site safety officer and with the permission of the customer.

Portable fire extinguishers shall be provided when necessary. Customers fire protection equipment mounted at various stations in their facilities shall not be used for job purposes.

11.1 FIRE AND EMERGENCY EVACUATION:

All Astro Electroplating, Inc, employees and subcontractor employees shall be familiar with the Site Emergency Evacuation procedures and follow directions to evacuate to the specific staging area.

At the time of the alarm, all work must stop and all fuel gases and ventilation equipment shut down. Return to the work site only upon the approval of the customer management in charge. Attachment F is the Emergency Telephone Notification List and shall be posted at each work location when applicable.

12.0 HAZARD COMMUNICATION AND WASTE MANAGEMENT:

In accordance with the OSHA Hazard Communication Standard (29CFR 1910.1200), we shall ensure that:

- All employees are aware of the existence of our hazard communication program.
- Employees are fully informed of all of the hazardous materials that they are exposed to.
- All hazardous materials are labeled.
- All our hazardous materials are maintained on the list of hazardous chemicals.

- All hazardous materials have a corresponding Material Safety Data Sheet and that the copies of all MSDS are readily available to all employees.
- All employees shall be guarded by both protective equipment and personal protective equipment to maintain the highest levels of safety.
- All employees are to be properly trained and informed of all the existing work place hazards.
- All employees will receive training for the provisions for this hazard communication plan in the initial tailboard safety talk.

The Hazard Communication Coordinator Site Safety Officer in conjunction with the Nelson, Pope & Voorhis, llc Company Representative. The company hazard communication coordinator shall be responsible for:

- Ensuring that he understands all of the information that is contained in the manual along with the OSHA Hazard Communication Standard (29CFR 1910.1200).
- Seeing that all employees are trained/informed of the Company's Hazard Communication Program and informed of where they can receive copies of anything and everything contained in this manual.
- Establishing an area at job site where all relevant hazard communication materials are stored and are readily accessible to all employees. This includes everything contained in this manual (including the list of hazardous chemicals, MSDS, emergency procedures).

MATERIAL SAFETY DATA SHEETS (MSDS):

- A MSDS must accompany a chemical delivery to the job site. A copy of all MSDS will remain at each job site and copy provided to Astro Electroplating, Inc.
- Chemicals delivered to the site without a MSDS will not be accepted.

- **Under no circumstances should there be any materials on the site, work area, that do not have a corresponding MSDS. It is the responsibility of the Site Safety Officer to ensure that all materials brought onto the work site have their own MSDS.**
- **Employees can gain access to any and all MSDS by requesting them from the Site Supervisor/Field Representative or Site Safety Officer, Project Engineer.**

CHEMICAL INVENTORY:

- **It is our company policy that all hazardous or potentially hazardous chemicals shall be listed on the chemical inventory list at our work site office. See Attachment J.**

The Project Engineer, is also responsible for reporting any adjustments made on the chemical inventory list to the Astro Electroplating, Inc Representative.

Spills and or releases of regulated liquids/hazardous substances/materials at the job site:

- **In the event of a spill or release of any regulated substance, the Astro Electroplating Site Representative shall be immediately notified.**
  Astro Electroplating and Nelson, Pope & Voorhis, llc, will maintain emergency spill kits at the job site to handle and contain spills as necessary.

13.0 EMPLOYEE ACCESS TO MEDICAL EXPOSURE RECORDS IN COMPLIANCE WITH OSHA 29CFR 1910.1020:

Astro Electroplating, Inc and Nelson, Pope & Voorhis, llc employees are instructed in their company procedures to access his/her medical exposure records, or their designated representative. Request must be made in writing and submitted to the Site Safety Officer or in his/her absence Site Supervisor (field coordinator) and forwarded to the company main offices in Farmingdale, New York.

In the employees absence, the designated representative must have this permission in writing and signed by the employee.

The request must be addressed to either hand deliver or mail to our corporate offices at 170 Central Avenue, Farmingdale, New York.

14.0 WELDING OPERATIONS/FLAME CUTTING:

- Welders shall have received training in the arc & mig welding process.
- Flame resistant clothing must be used during the welding process. Tyvek coveralls fire retardant rating can be used. If using cotton or Nomax Laundering contractor shall be established to wash contaminated coveralls and hoods.
- The welding area shall be inspected to insure that there are no combustible materials present. Fire extinguishers shall be present and available during welding operations.
- Shielding of welding operations from others required.
- Use of respiratory protection may not be applicable to this operation.

- **Compressed Gas Cylinders will not be allowed in the vault, manholes, and excavations/trenches at any time. Any application requiring the use of combustible gas must have hose of sufficient length to reach the work area. When not in use, the cylinder must be closed and the lines bled. An employee properly qualified and trained shall perform all flame cutting.**
- **The welder, helper, and any other personnel present must have proper eye protection at all times during welding operations. Second employee helper shall be a fireguard. Employee must know how to properly use a portable fire extinguisher. Fire Guard Daily Checklist, Attachment G.**
- **Welders/Burners required to wear a respirator shall have had a medical evaluation within the last twelve (12) months and approved by the attending medical professional. In addition, a fit test — qualitative/quantitative must be performed annually. Employees not with the approval cannot wear a respirator.**
- **During welding operations in Confined Spaces, continuous monitoring shall be performed and proper ventilation using a fume eliminator or copious blower should be used.**

15.0 ELECTRICAL SAFETY:

Work area shall be checked for the presence of high voltage and other hazardous electricity sources. Sources shall be labeled and work areas provided with shielding or located at sufficient distance from the sources to prevent contact or arcing to personnel or equipment. Locate and ensure there will be no adverse contact with overhead utilities prior to positioning or moving any elevated work platform or rig superstructure.

When high voltage electrical service is required for site or project activities, service shall be connected by certified electricians in accordance with all applicable local and National Electric Codes.

Ground Fault Circuit Interrupters shall be used in the absence of properly grounded circuitry or when portable tools must be used around wet areas.

Electric lines, cables, and extension cords must be appropriately guarded and maintained in good condition.

No work will be done on electric lines or electrically activated equipment until the verification that service has been de-energized and/or the system has been locked and tagged out and each worker doing the work has sole possession of a key to a lock on the lock-out hasp.

HIGH VOLTAGE:

1. Whenever possible, electrical equipment and electric conductive equipment is guarded or de-energized as a means of engineering control. When it is necessary to work with or around energized power transmission equipment, and use of permanent guarding is infeasible, grounding and personnel protective equipment is required. Personnel who have been specially trained to work around high voltage electricity must do work.

16.0 LADDER SAFETY:

- Inspection of ladders before using.
- Metal extension or "A" frame ladders are prohibited in electric vaults or near power lines.
- Damaged ladders such as broken or missing rungs or steps, broken or split side rails or braces missing – ladders shall be removed from service and disposed of.

- **Only one person on a ladder at a time and never stand on the top rung of a ladder.**
- **Ladder's placement using the 4-1 pitch, straight or extension ladder, shall extend the minimum of two rungs above the vault/platform floor surface (3 feet).**

17.0 PROCEDURE FOR PERMIT-REQUIRED CONFINED SPACE ENTRY:

- **Evaluate the job to be done and identify the potential hazards before a job in a confined space is scheduled.**
- **Ensure that all process piping, mechanical and electrical equipment, etc., have been disconnected, purged, blanked-off, or locked and tagged as necessary.**
- **If possible, ensure removal of any materials that may produce toxic or air displacing gases, vapors, or dust.**
- **Initiate a Confined Space Entry Permit (CSEP).**
- **Ensure that any hot work (welding, burning, open flames, or spark-producing operation) that is to be performed in the confined space has been approved by the SHSC and is indicated on the CSEP.**
- **Ensure that the space is ventilated before starting work in the confined space and for the duration of the time that the work is to be performed in the space, unless limited by design.**
- **Ensure that the personnel who enter the confined space, the entry supervisor, and the confined space attendants are familiar with the contents and requirements of this procedure.**
- **Ensure remote atmospheric testing of the confined space prior to employee entry and before validation/revalidation of a confined space entry permit. The following monitoring must be done in sequence:**
  1. **Verification of oxygen content: - Oxygen content between 19.5%-23.5%**
  2. **Verification of Flammable atmosphere: L.E.L. less than 10%.**

Note: L.E.L. readings are valid only for fire or explosion hazard protection. Verification of toxicity of the compound(s) causing the reading must be verified to ensure employee safety.

3. **Verification of potential or known toxic air contaminants: Ensure that levels are within the acceptable entry criteria for the level of protection afforded.**

Note: If a hazardous atmosphere is suspect or known and if remote testing of all areas of the confined space is not possible, Level B PPE is required. A monitor for oxygen content and combustible gases will be carried into the confined space with the entry team.

The attendant or the entry team as appropriate must conduct periodic and/or continuous monitoring for levels of other atmospheric contaminants.

Note: Sampling must be done throughout all levels of the confined space.

- **Designate whether hot or cold work will be conducted. Complete the CSEP listing any safety precautions, protective equipment, or other requirements. Note: for hot work performed in confined spaces, no combustible or flammable gases or vapors and no concentrations of combustible dusts (see definition) may be evident.**
- **The CSEP must either be posted at the confined space or available with the attendant.**

The CSEP shall be considered void if work in the confined space does not start within one-half hour after initial monitoring is performed or if significant changes within the confined space atmosphere or job scope occur. For modified confined space entries permit duration will be determined on a case-by-case basis.

The CSEP shall be cancelled by the Entry Supervisor and removed at the completion of the job or the end of the shift, whichever is first.

A copy must be placed in the project Health and Safety file after use. A copy of the completed CSEP must be submitted to the client representative upon completion. The Safety Officer must forward complete copies of all CSEPs to Astro Electroplating, Inc main office.

PROCEDURE FOR MODIFIED PERMIT SPACE ENTRY:

Two conditions exist that allow personnel to evaluate and effect entry into confined spaces under a modified permit entry.

1. **If the space only poses an actual or potential hazardous atmosphere:**
   It must be demonstrated and documented that continuous forced ventilation will maintain safe entry conditions.

   There may be no hazardous atmosphere within the space whenever employees are inside.

   The atmosphere must be continually tested to ensure that forced ventilation is preventing a hazardous atmosphere from developing.

   If a hazardous atmosphere develops:

   The space must be immediately evacuated.

   The space must be evaluated to determine how hazards developed.

   Measures must be implemented to ensure employee safety prior to subsequent entry.

2. **If the space poses no actual or potential hazardous atmosphere but has additional hazards:**

   Document and verify that no hazardous atmosphere is evident.

   Note: Forced ventilation does not constitute elimination of atmospheric hazards.

   All hazards must be eliminated without entry into the space.

   If entry into the space must be made to eliminate all hazards, the entry must be made under full permit requirements.

Under Astro Electroplating, Inc, Modified Permit Program, if the above conditions can be met then entry can be made without the following: (1) specialized personal protective equipment; (2) outside communications; and (3) rescue service compliance. All other provisions of the permit must be followed and complied with.

18.0 EMERGENCY EYE WASH STATIONS:

Emergency Eye Wash Stations shall be provided at each work site with the minimum of 15 to 20 minutes of continuous eyewash.

19.0 STORAGE AND HANDLING OF COMPRESSED GAS CYLINDERS:

A. All compressed gas cylinders shall be stored upright, with their caps in place, away from combustible materials and separated at a minimum of 20 feet from any source of heat.

B. Oxygen cylinders in storage shall be separated by a ½ hour fire resistant shield or by a distance of at least 20 feet from acetylene and other combustible gases.

C. All compressed gas cylinders shall be secured in an upright position in a manner which ensures that they will remain upright at all times.

D. Compressed gas cylinders which are moved on approved burning carts with mounted regulators must be secured in an upright position.

E. Cylinders without regulators must have caps installed before they are transported and at all times while they are being transported.

20.0 ALCOHOL AND DRUG FREE WORKPLACE POLICY:

In compliance with the Drug Free Workplace Act of 1988, and our commitment to provide a safe and accident free working environment, Astro Electroplating, Inc, has mandated an alcohol and drug free workplace.

Astro Electroplating, Inc, recognizes that substance abuse in the workplace is a serious issue. We believe that by eliminating substance abuse, we will improve the safety, health and general well being of our employees, at all levels of employment. The object of this policy is to:

- Maintain productive employees.
- Provide a safe and healthy working environment for all employees.
- Cooperate with the owners/operators at our projects.
- Comply with all Local, State and Federal health and safety regulations.
- Prevent job site accidents and loss of skilled and valued employees.

- Inform its employees of the hazards of using alcohol and illegal substances.
- Screen its employees for the bodily presence of alcohol and illegal substances.
- Prohibit substance abusers from becoming Astro Electroplating, Inc, employees.
- Remove substance abusers from Astro Electroplating, Inc workplace.
- Where possible, provide information to abusers to assist their rehabilitation efforts.

21.0 SANITATION AND INDUSTRIAL HYGIENE:

Employees and subcontractors will be instructed if oil or dust is in contact with their skin. If contact is made, they will be cleansed immediately in Decon Area using soap and water. We shall encourage all employees to shower when leaving the work site.

- Toilet facilities shall be provided at the work sites. With the permission of customer, the building facilities can be used.
- Drinking water shall be provided only in the clean zone. With permission of the customer, we may use the facility water fountains.
- Good Housekeeping shall be maintained throughout the workday. All trash and debris shall be removed promptly to the designated disposal dumpsters.
- Emergency eye wash station shall be provided at the work site. The customer's emergency eye/body shower may be used with their prior permission.

22.0 WORK PERFORMANCE:

There shall be three (3) zones established as follows:

- Restricted Zone (exclusive zone): Immediate Work Area Excavation or Trenching, Soil Removal (remediation).

- **Decontamination Zone: Contaminant reduction zone, to include the following:**
  1. **Designated step off pad-poly sheeting over ground area.**
  2. **Drums for disposal of coveralls, booties, gloves.**
  3. **Drum for holding contaminated tools for continued use.**
  4. **Decon-shower and washing area with soap and water. Water discharge shall filter through 3 filtration filters, 25 micron, 10 micron, 5 micron. Shower area to be adjacent to clean room for changing into street cloths. All employees engaged in remediation work shall exit through decon shower. We shall provide body soap, shampoo and disposable under garment.**

Note: This area will be maintained clean at all times. When employees exit the clean area, they are in the final clean zone.

- **Clean Zone: This is the support zone, to provide staging, access and supplies to the warm zone. The area will be demarcated and properly manned to restrict access to authorized personnel. These areas shall serve as a meeting and storage area and shall be the only zone on-site where eating, drinking and smoking will be allowed.**

Signage shall be placed on all sides of barriers with potential for outsiders to enter to warn them of hazards.

- **Establish work area using stanchions and barricade tape or Class 1 type barricades or barrier tape and stanchions.**
- **General Housekeeping must be maintained at all times, trash and waste disposal must be placed into plastic bags sealed for disposal into the designated drum or dumpster.**

- **A final inspection of complete work area must be performed by the Site Supervisor or lead mechanic and documented in the work performance sheet that this was completed.**

23.0 HEAT STRESS:

Wearing PPE puts a worker at considerable risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker.

Individuals vary in their susceptibility to heat stress. Factors that may predispose someone to heat stress include:

- **Lack of physical fitness.**
- **Lack of acclimatization.**
- **Age**
- **Dehydration**
- **Obesity**
- **Alcohol and drug use.**
- **Infection**
- **Sunburn**
- **Diarrhea**
- **Chronic Disease**

Reduced work tolerance and the increased risk of excessive heat stress are directly influenced by the amount and type of PPE worn.

PPE adds weight and bulk, severely reduces the body's access to normal heat exchange mechanisms (evaporation, convection, and radiation) and increases energy expenditure.

We shall establish a rest area with sunshade barrier in the cold zone for all employees and encourage them to take periodic work breaks to rest and restore body fluids.

We will provide cool drinking water and electrolytes such as Gatorade or Perks Plus drink.

Recognizing Heat Stress Disorders:

Overexposure to heat stress can cause heat illness. Heat illnesses can be divided broadly into 5 classes in order of increasing severity: heat rash, heat cramps, heat syncope, heat exhaustion and heat stroke:

1. **HEAT RASH: (prickly heat) A skin rash caused by heat and humidity. When sweat doesn't evaporate, sweat ducts become clogged and sweat glands become inflamed.**
   PREVENTION: Keep the skin as dry as possible, shower daily and wear fast-drying clothing.
   FIRST AID: Rest in a cool place, apply soothing lotion or powder.

2. **HEAT CRAMPS: Muscular pains and spasms due to loss of salt from the body by sweating or inadequate intake of salt.**
   PREVENTION: Insure adequate intake of salt and fluids.
   TREATMENT: Drink fluids; eat salted foods; massage the affected muscles.

3. **HEAT SNYCOPE (fainting): Caused by inadequate blood supply to the brain. It is manifested by weakness or fatigue, blurred vision, pallor, and fainting.**
PREVENTION: When in hot temperatures, move around and stretch to improve circulation.
FIRST AID: Rest in a reclining or lying position. Drink water.

4. **HEAT EXHAUSTION: A more serious disorder caused by failing to replenish fluids lost in perspiration.**
SYMPTOMS: (May include) Dry mouth, excessive thirst, uncoordinated actions, headache, dizziness, fatigue, muscle weakness.
FIRST AID: Move to a cool area, have victim lie down and raise feet 8-12 inches, apply cool wet cloths to forehead, give fluids, seek medical attention.

5. **HEAT STROKE:**

When the body can't cool itself because its temperature-regulating system is overloaded, permanent damage to the brain and vital organs or even death can occur. This is the most severe heat disorder and is always life threatening.

Signs and symptoms: extremely high body temperature (105 degrees or more), hot, dry, flushed skin, no sweating, confusion, seizure and coma.

First Aid: Don't wait for the ambulance to arrive before Starting first aid.....move the victim to a cool place, soak the victim's clothing in cool water and fan the body to encourage cooling, seek medical attention.

ENVIRONMENTAL SUBCONTRACTOR(S):

Astro Electroplating, Inc and Nelson, Pope & Voorhis, llc will require that all subcontractors conform to Astro Electroplating, Inc, Environmental Health & Safety Site Specific Plan on PPE. Where work requires remediation activities such as the removal of contaminated soil, the PPE required will include the following:

1. **Chemical resistant disposable saran coveralls to include hood and booties.**
2. **Chemical resistant gloves (nitrile).**
3. **Respirators (See Respiratory Section)**
4. **Hard Hats**
5. **Safety Shoes, Rubber Boots.**

When hazards have been removed and verified by monitoring and sampling, the PPE will be downgraded accordingly by the competent person. All contaminated PPE will be disposed of in approved waste containers and properly manifested as required by Local, State and Federal Regulations.

24.0 TRAINING SECTION:

Prior to arriving at the work site, all employees and subcontractor employees must have completed training course in the following:

40-Hour Hazwopper Training
Confined Space Awareness
Fire Prevention/Evacuation
Personal Protective Equipment
Ladder Safety
Hazard Communication
Trenching & Excavation
Fall Protection
Respirator Training

24A: TRENCHING AND EXCAVATING:

All excavations greater than 4 feet shall be considered Permit-Required Confined Spaces. Only trained qualified employees shall be permitted to work in these specific excavations. All authorized entrants shall be required to wear full body harness. In addition to the PPE prescribed, a retrieval system shall be in place and entrant shall be hooked up to retrieval line at all times while working in excavations. If more than one (1) entrant, there shall be separate retrieval for each. The competent person supervisor shall complete the daily entry permit form indicating entrant names and employee numbers or social security numbers. There shall be a qualified attendant at top outside excavation at all times one (1) attendant may monitor more than one entrant. The attendant must have capability to summon rescue and other emergency services. We shall post the emergency numbers for easy access when needed.

A portable phone or walkie-talkie shall be provided and in working order at all times for this purpose. Responding rescue personnel shall be Qualified Entrant Subcontractors and/or Employees who have current Confined Space Rescue Training. They will be instructed on rescue and retrieval of possible victims. The names of these employees will be posted for each shift on designated bulletin board for notices to employees.

Excavations greater than 4-feet shall require continuous air monitoring whenever occupied.

A qualified first-aider shall be on duty each shift to provide emergency assistance as may be necessary. In all emergency situations, a direct call must be made to 911 and followed by notification to security services at the main gate.

Excavations over 4-feet shall be shored and sheeted in compliance with the Occupational Safety and Health Act 29CFR 1926.650 and 651.

All remediated soils shall be removed and containerized or placed in the designated holding area for disposal. If soils are placed on ground, the ground area shall be covered with poly sheeting and excavated soils placed on the sheeting, and surrounded by absorbent booms, and covered with poly sheeting to protect against rain and prevention of run-off. All water entering or seeping into excavations will be pumped and filtered through 25-10-5 micron filtration system and then allowed to empty into drainage system.

Subcontractor employees enter excavations shall have completed the required training as listed under our training section. Access to excavation shall be made using fiberglass ladders of sufficient length to provide the minimum of 3-foot above the top of excavation for safe entering and egress.

24B TRAINING:

Ladder Training:

- **Inspection of ladders before using.**
- **Metal extension or "A" frame ladders are prohibited in customer's electrical facilities.**
- **Damaged ladders such as broken or missing rungs or steps, broken or split side rails or braces missing – ladders shall be removed from service and disposed of.**
- **Only one person on a ladder at a time and never stand on the top rung of the ladder.**
- **Ladder's placement using the 4-1 pitch, straight or extension ladder, shall extend the minimum of 2 rungs above working platform (3 feet) or top or trench.**
- **Ladders in excavations will not be placed greater than 25 feet away in either direction.**

24C CONFINED SPACE AWARENESS TRAINING:

- All employees have received training to perform work in Permit-Required Confined Spaces in compliance with OSHA 29CFR 1910.146. Employees received instructions in the use of the Tripod Retrieval System and use of full body harness.
- 3rd party subcontractor will conduct atmosphere monitoring.
- Attached is the Permit Required Entry Checklist, Attachment I. This checklist must be posted near entry point and remain until completion of the work in the confined space.

24D FALL PROTECTION TRAINING:

- Instructions and training were given to all Astro Electroplating, Inc employees in compliance with OSHA 29CFR 1926.500, 501, 502, 503, and 504.
- Specific instructions were given to employees in the application and use of personal fall protection equipment; and emphasizing the use and care of full body harness, shock absorbing lanyard, rope grab, and safety life line.

24E HAZARD COMMUNICATION TRAINING:

Employees have completed Hazard Communications Instruction on the limited materials that they use in their work place. However, instructions shall be given on the following in compliance with OSHA 29CFR 1910.1200, Hazard Communication Program:

1. Labels and other forms of warning indicating precautionary measures such as "Do Not Use Near Open Flame", etc.
2. Material Safety Data Sheets (MSDS). This must be provided for each hazardous chemical that is produced or imported.
3. The MSDS provides the detailed information on each hazardous chemical, including potential hazardous effects, physical and chemical characteristics and recommendations for appropriate measures.
4. Employees receive training initially on the hazardous chemicals and again whenever the hazard changes.
5. The training consists of instructions such as "Knowing Chemical States such as Solid, Liquid or Gas", "How Chemicals Enter the Body", "The Time Weighted Average TWA", "Threshold Limit Value", "TLV", "PEL Permissible Exposure Limit".
6. The Site Safety Officer shall complete the attached Hazardous Chemicals Inventory Form. This inventory shall be kept updated throughout this project.

25.0 LOCKOUT/TAGOUT:

Astro Electroplating, Inc Management and employees shall follow the company lockout/tagout procedures and instructions. These instructions or procedures should be reviewed at the time we obtain a work permit. The Site Supervisor shall instruct all employees involved in work procedures. This shall be conducted at the pre-job briefing daily.

Astro Electroplating, Inc Lockout/Tagout procedures shall insure that electricity remain temporarily "off" without a lockout/tagout system, there is the possibility that a machine will suddenly start up. Then someone could be cut, hit, or crushed. There is a serious danger of electric shock or release of hazardous chemicals.

To prevent such incidents, we shall identify power sources:

- **Electricity, stored electricity (such as capacitor).**
- **Stored pressure (such as compressed air).**
- **Stored mechanical energy (such as in a coiled spring).**

Our standard practice is to take seven (7) steps for lockout/tagout as follows:

1. **<u>Think, Plan and Check</u>: Site Supervisor in charge shall think through the entire procedure. Identify all parts of any systems that need to be shut down. Determine what switches, equipment, and people will be involved. Carefully plan how restarting will take place.**
2. **<u>Communicate</u>: Let all those who need to know that a lockout/tagout procedure is taking place.**
3. **<u>Identify all appropriate power sources</u>, whether near or far from the job site. Include electrical circuits, hydraulic and pneumatic systems, spring energy, and gravity systems, chemical processes.**
4. **<u>Neutralize all appropriate power at the source</u>. Disconnect electricity. Block moveable parts. Release or block spring energy. Drain or bleed hydraulic and pneumatic, chemical uses.**
5. **<u>Lockout all power sources</u>. Each workcrew has a personal lock, labeled with his or her name and company. We also use clips, chains and lockout boxes.**
6. **<u>Tagout all power sources and equipment</u>. Tags explain the reason for the lockout, employee or supervisor name and how to reach them, and the date and time of tagging. Tag equipment controls, pressure lines, starter switches, and suspended parts.**
7. **<u>Do a complete test</u>. Double check all steps above. Do a personal check. Push start buttons, test circuits, and operate valves to test the system.**

When it is time to restart, after the job is completed, follow the safety procedures we set up for restart. With all workers safe and equipment ready, then it's time to turn on the power or energy source.

26.0 ATTACHMENTS:

- **A- Safety Meeting Log**
- **B- Vehicle Accident Report**
- **C- OSHA 301, Injury Investigation Report**
- **D- Guidelines for Completing Letter of Explanation (Describing the Accident)**
- **E- OSHA 300 Log**
- **F- Federal Agencies Telephone List**
- **G- Fireguard Daily Checklist**
- **H- Emergency Reference Table**
- **I- Permit-Required Entry Checklist**
- **J- Chemical Inventory List**
- **K- Burning, Welding, Hot Work Permit**

This safety program will be communicated to all employees. The Environmental Health and Safety Plan do not preclude on-site management from applying additional safe work practices as may be necessary.

SUBCONTRACTOR AGREEMENT

WE HAVE READ AND UNDERSTAND THE ASTRO ELECTROPLATING INC SITE SPECIFIC ENVIRONMENTAL HEALTH & SAFETY PLAN FOR THE INACTIVE HAZARDOUS WASTE DISPOSAL SITE LOCATED AT 170 CENTRAL AVENUE, FARMINGDALE, NEW YORK.

WE AGREE TO ABIDE BY THE INFORMATION CONTAINED IN THIS PLAN, THE POLICIES, SAFETY RULES, REGULATIONS, IT'S CLIENTS AND LOCAL, STATE AND FEDERAL AGENCIES.

_____

SUBCONTRACTOR

_____

NAME

_____

DATE

Attachment A

ASTRO ELECTROPLATING, INC.

SAFETY MEETING LOG

LOCATION: _____

SUPERINTENDENT: _____

TIME: _____

SUBJECT: _____

_____

ATTENDEES:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

COMMENTS:

ACCIDENT INVESTIGATION REPORT

ASTRO ELECTROPLATING, INC.

ATTACHMENT B

ACCIDENT DATE	ACCIDENT TIME AM ____ PM	PAYROLL NO.	CONTROL NUMBER	SEAT BELTS IN USE ☐ YES ☐ NO	VEHICLE NUMBER

NAME OF DRIVER	JOB TITLE	LENGTH OF SERVICE YRS. MOS.

LOCATION OF ACCIDENT	DEPT. CLASSIFICATION	MV 104 PREPARED ☐ YES
	COMMITTEE CLASSIFICATION	DATE PREPARED

DRIVER

1. DID ACCIDENT OCCUR DURING OVERTIME? ☐ YES ☐ NO
2. TOTAL YEARS DRIVING
3. TOTAL YEARS DRIVING FOR COMPANY
4. AGE OF DRIVER
5. CLASS AND STATE OF LICENSE
6. DRIVER AUTHORIZED ☐ YES ☐ NO
7. DATES & CLASSIFICATION OF PREVIOUS ACCIDENTS:

VEHICLE

1. SMALL SEDANS & SUBURBANS
2. MEDIUM SEDANS & SUBURBANS
3. LARGE SEDANS & SUBURBANS
4. TRUCKS TO 1½ TONS
5. TRUCKS OVER 1½ TONS TO 2½ TONS
6. TRUCKS OVER 2½ TONS TO 4 TONS
7. TRUCKS OVER 4 TONS
8. RENTED VEHICLES
9. SPECIAL EQUIPMENT

ROADWAY

1. DRY
2. WET
3. MUDDY
4. SNOW
5. ICE
6. SLUSH

WEATHER

1. CLEAR
2. CLOUDY
3. RAIN
4. SNOW
5. SLEET/HAIL
6. FOG

TRAFFIC REGULATION

1. RECKLESS DRIVING
2. SPEEDING
3. DRIVING ON PLAYSTREET/SIDEWALK/WRONG SIDE
4. FAILURE TO SIGNAL
5. PASSING ON HILL OR CURVE
6. IMPROPER PARKING
7. PASSING TRAFFIC CONTROL DEVICE
8. DRIVING UNDER INFLUENCE ALCOHOL/DRUGS
9. IMPROPER TURN
10. WRONG WAY ON ONE-WAY STREET
11. PASSING ON WRONG SIDE

ACCIDENT

1. PASSING A MOVING VEHICLE TOO CLOSELY
2. PASSING A STATIONARY VEHICLE (OBJECT) TOO CLOSELY
3. FOLLOWING TOO CLOSELY
4. TRAVELING TOO FAST FOR CONDITIONS
5. CARELESS BACKING
6. FAILURE TO GRANT RIGHT OF WAY
7. LOSS OF CONTROL
8. TRAFFIC REGULATION VIOLATED
9. CUTTING IN OR SUDDEN TURNING OUT
10. INATTENTION
11. BRAKES
12. STEERING
13. LIGHTS
14. OTHER (SPECIFY):

A NON-PREVENTABLE	D SUPERVISION
B PREVENTABLE	E MISCELLANEOUS
C PEDESTRIAN	

DIAGRAM OF ACCIDENT SCENE

PROPERTY DAMAGE: ☐ YES ☐ NO

PERSONAL INJURY: ☐ CO. EMPL. ☐ OTHER

DESCRIBE HOW ACCIDENT OCCURED

PREVENTIVE MEASURES

ATTACHMENT C

OSHA's Form 301
Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1220-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone (___) ___-____ Date ___/___/___

Information about the employee

1) Full name _____

2) Street _____

City _____ State _____ ZIP _____

3) Date of birth ___/___/___

4) Date hired ___/___/___

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional _____

_____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ ZIP _____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the *Log* _____ (*Transfer the case number from the Log after you record the case.*)

11) Date of injury or illness ___/___/___

12) Time employee began work ___:___ AM / PM

13) Time of event ___:___ AM / PM ☐ Check if time cannot be determined

14) ***What was the employee doing just before the incident occurred?*** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) ***What happened?*** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) ***What was the injury or illness?*** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or "sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) ***What object or substance directly harmed the employee?*** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) ***If the employee died, when did death occur?*** Date of death ___/___/___

ATTACHMENT D

GUIDELINES FOR COMPLETING LETTER OF EXPLANATION

ASTRO ELECTROPLATING, INC.

As everyone is aware, along with the standard accident report, you are required to submit a letter describing the accident. In order to help you organize and write the letter, please try and answer the following questions:

1. **How did the accident happen? Include details, sketches, etc.**
2. **Who was responsible?**
3. **What could be done to prevent it from happening again?**
4. **Was all of the above explained to the employee?**
5. **What was the final disposition? Did the employee return to work that day? Did the employee have any restriction?**
6. **Copy must be sent to the Manager.**

ATTACHMENT E

OSHA's Form 300

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20___

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name ______________________

City ______________ State ______________

Identify the person | **Describe the case** | **Classify the case**

Using these four categories, check ONLY the most serious result for each case: Death / Days away from work / Remained at work

Enter the number of days the injured or ill worker was:

Check the "Injury" column or choose one type of illness: (M)

(A) Case no.	(B) Employee's name	(C) Job title (e.g., Welder)	(D) Date of injury or onset of illness	(E) Where the event occurred (e.g., Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g., Second degree burns on right forearm from acetylene torch)	(G) Death	(H) Days away from work	(I) Remained at work: Job transfer or restriction	(J) Remained at work: Other record-able cases	(K) On job transfer or restriction	(L) Away from work	(1) Injury	(2) Skin disorder	(3) Respiratory condition	(4) Poisoning	(5) All other illnesses
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐
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			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐
					Page totals ➤	___	___	___	___	___	___	___	___	___	___	___

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Injury (1) | Skin disorder (2) | Respiratory condition (3) | Poisoning (4) | All other illnesses (5)

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

OSHA's Form 300A

Summary of Work-Related Injuries and Illnesses

Year 20__

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
(G)	(H)	(I)	(J)

Number of Days

Total number of days of job transfer or restriction	Total number of days away from work
(K)	(L)

Injury and Illness Types

Total number of . . .	(M)
(1) Injuries	
(2) Skin disorders	
(3) Respiratory conditions	
(4) Poisonings	
(5) All other illnesses	

Establishment information

Your establishment name

Street

City State ZIP

Industry description (e.g., *Manufacture of motor truck trailers*)

Standard Industrial Classification (SIC), if known (e.g., *SIC 3715*)

Employment information *(If you don't have these figures, see the Worksheet on the back of this page to estimate.)*

Annual average number of employees

Total hours worked by all employees last year

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Company executive Title

( ) Phone Date

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

ATTACHMENT F

NEW YORK STATE, FEDERAL AGENCIES:

NEW YORK STATE AGENCIES	PHONE NUMBERS
Department of Environmental Conservation ~~50 Wolf Road~~ 625 Broadway Albany, NY 12233-7015	518-~~457-3446~~ 402-9621
Department of Environmental Conservation Region 2 Office 47-40 21st Street Long Island City, NY 11101	718-482-4949
DEC Spill Hotline	800-457-7362
Department of Health (legal affairs) 5 Penn Plaza New York, NY 10016	212-613-2650
FEDERAL AGENCIES	
National Response Center	800-424-8802
United States Army Corps of Engineers 26 Federal Plaza, Room 1909 New York, NY 10278-0090	212-264-0100
United States Environmental Protection Agency (Region 2) 26 Federal Plaza New York, NY 10278	212-637-3000
Federal Emergency Management Agency Room 1337 26 Federal Plaza New York, NY 10278	212-225-7209

Attachment G

FIREGUARD DAILY CHECKLIST
ASTRO ELECTROPLATING, INC.

NAME
FIRE GUARD_____ CERTIFICATE #_____

DATE_____ SHIFT_____ LOCATION_____

1. Are sufficient fire extinguishers on hand at least one for each torch. **YES** **NO**

2. Are all cylinders with regulators secured by chains. **YES** **NO**

3. Combustible material such as wood, paper cardboard, trash containers, drums of oil, etc., must be kept at least 25 feet away from burning operations, or install protective covers such as burning blanket or other non-combustible shields. **YES** **NO**

4. Only cylinders in use are permitted at the job site. **YES** **NO**

5. Are all oxygen and fuel gas cylinders, hoses, torches within your visual sight at all times. **YES** **NO**

6. At end of the shift, did you conduct an initial inspection of exposed areas one half hour after completion of torch operations.
   Completed 1st Inspection **YES** **NO**
   Comments:_____

_____

7. Did you conduct a final inspection 30 minutes after the 1st inspection if not relieved by 2nd shift fire guard.
   Completed 2nd Inspection **YES** **NO**
   Comments:_____

_____

Signature of
Fire Guard_____

Note: Completed forms must be immediately turned into your Safety Coordinator.

ATTACHMENT H

EMERGENCY REFERENCE TABLE

ASTRO ELECTROPLATING, INC.

AMBULANCE TELEPHONE NUMBER: **911**

POLICE TELEPHONE NUMBER: **911**

FIRE NUMBER: **911**

FIRST AID NUMBER: **911**

HOSPITAL NUMBER:

BRUNSWICK HOSPITAL CENTER
366 BROADWAY
AMITYVILLE, NY
516-789-7000

DIRECTIONS TO HOSPITAL:

Please refer to the individual hospital maps that are attached.

COMPANY REPRESENTATIVES:

Manager:

Site Supervisor:

MAP & DIRECTIONS TO HOSPITAL

FROM:	TO:
170 Central Ave Farmingdale, NY 11735-6912 US	366 Broadway Amityville, NY 11701-2711 US
☐ Farmingdale Offers: Hotels Go	☐ Amityville Offers: Hotels Go

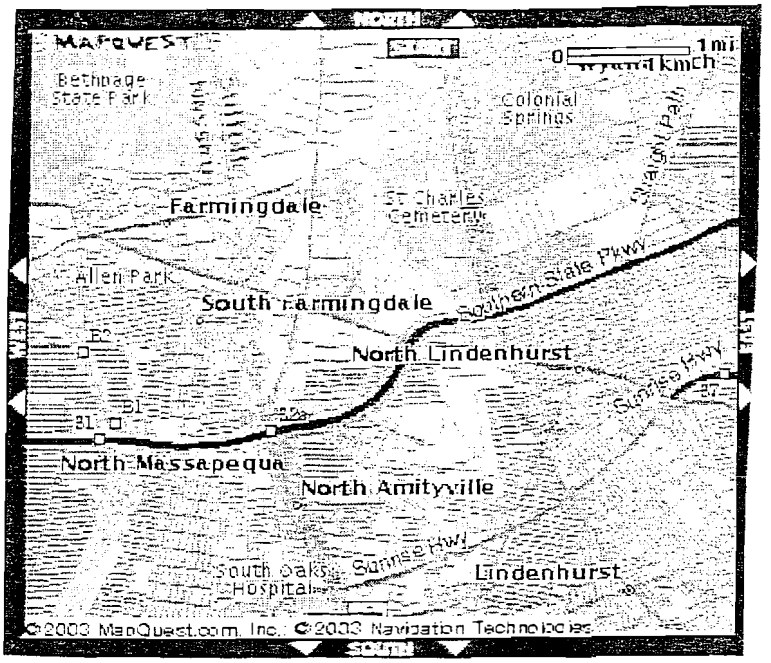
Total Distance: 6.49 miles
Total Estimated Time: 12 minutes

E-mail Route: user@email.com Go Or, Send to a PCS Phone Sprint

FASTEST ROUTE | SHORTEST ROUTE | AVOID HIGHWAYS

DIRECTIONS	DISTANCE
1: Start out going East on CENTRAL AVE toward ENGINEERS LN.	0.24 miles
2: Turn RIGHT onto WELLWOOD AVE/ CR-3/ PINELAWN RD. Continue to follow WELLWOOD AVE/ CR-3.	2.19 miles
3: Take the SOUTHERN PARKWAY WEST ramp.	0.12 miles
4: Merge onto SOUTHERN STATE PKWY/ SOUTHERN PKWY W.	2.13 miles
5: Take the RT-100 S exit- exit number 32S- toward AMITYVILLE.	0.17 miles
6: Merge onto BROADWAY/ NY-110 S.	1.65 miles

Total Estimated Time: 12 minutes **Total Distance:** 6.49 miles



AMBULANCE CALL_____ RESCUE CALL_____ FIRE CALL_____

Note: Outside Rescue Services can only be used for support of on-site rescue team.

ATTACHMENT I

ASTRO ELECTROPLATING, INC.

CONFINED SPACE ENTRY PERMIT

START DATE:_____ TIME:_____ DURATION:_____(ONLY GOOD FOR ONE SHIFT).

NATURE OF HAZARD IN PERMIT SPACE:

____ OXYGEN DEFICIENCY (<19.5%)
____ FLAMMABLE GASES & VAPOR (>10% OF THE L.E.L. OR 02%>23.5)
____ MECHANICAL HAZARDS
____ ELECTRICAL HAZARDS
____ MATERIALS HARMFUL TO SKIN
____ ENGULFMENT
____ OTHER

EQUIPMENT REQUIRED FOR ENTRY:

____ RESPIRATOR
____ LIFELINE OR HARNESS
____ PROTECTIVE CLOTHING
____ HEARING PROTECTION
____ OTHER

ELECTRICAL EQUIPMENT/TOOLS:

____ GROUND FAULT INTERRUPTERS

RESPIRATORY PROTECTION:

COMMUNICATION AID:

RESCUE EQUIPMENT & RETRIEVAL SYSTEM:

ON-SITE RESCUE TEAM FOR IDLH ATMOSPHERES:

NAMES: Supervisor Rescue Members 1:

2:_____ 3:_____ 4:_____

AUTHORIZED ENTRANTS:

_____
_____
_____
_____

AUTHORIZED ATTENDANTS:

_____
_____
_____
_____

PREPARATION:

____ NOTIFY CLIENT/CUSTOMER OF SERVICE INTERRUPTION
____ ISOLATE BLANK OR DOUBLE VALVE, WITH LOCK AND TAG
____ ZERO ENERGY STATE (LOCK OUT ALL ENERGY SOURCES)
____ CLEANED, DRAINED, WASHED, AND PURGED
____ CREWED INFORMED OF SPECIAL SPACE HAZARDS
____ VENTILATION TO PROVIDE (FRESH AIR)
____ PROCEDURES REVIEWED W/ EACH EMPLOYEE
____ ATMOSPHERIC TEST IN COMPLIANCE
____ ATTACH HOT WORK PERMIT
____ OTHER
____ EMERGENCY RESPONSE TEAM ALL NOTIFIED

TEST	PERMISSIBLE LIMITS	RESULTS CHECKED BY	TIME___ RESULTS	TIME____ RESULTS	TIME___ RESULTS	TIME ____ RESULTS	TIME___ RESULTS
OXYGEN	>19.5 & <23.5						
FLAMMABLE	<10% L.E.L.						

PERMIT AUTHORIZATION:

I CERTIFY THAT ALL ACTIONS AND CONDITIONS NECESSARY FOR SAFE ENTRY HAVE BEEN PERFORMED.

NAME_____

SIGNATURE_____

DATE_____TIME_____

PURPOSE FOR ENTRY HAS BEEN:

COMPLETED ☐
TERMINATED ☐

NAME:_____

SIGNATURE:_____

DATE:_____TIME:_____

NOTES/COMMENTS_____

HAZARDOUS CHEMICALS INVENTORY

Astro Electroplating, Inc.

Attachment J

LOCATION:

MATERIAL NAME	MANUFACTURER NAME AND ADDRESS	PROCESS/OPERATION WHERE USED

ASTRO-ELECTROPLATING, INC.

BURNING – WELDING – HOT WORK PERMIT

Attachment K

Valid from _____ to _____, _____
(am/pm) (am/pm)

1. Work Description
Equipment Location or Area _____
Work to be done:

2. Gas Test

☐ None required				
☐ Instrument Check	Test Results	Other Tests	Test Results	
☐ Oxygen 20.8% Min				
☐ Combustible % LFL				

Gas Tester Signature _____ Date _____ Time _____

3. Special Instructions ☐None ☐Check with Issuer before beginning work

4. Hazardous Materials ☐None What did the line / equipment last contain?

5. Personal protection ☐ Standard Equipment: welders hood with long sleeves; cutting goggles
☐Goggles or Face Shield ☐ Respirator ☐ Forced Air Ventilation
☐ Standby Person ☐ Other, Specify: _____

6. Fire Protection ☐None required ☐ Portable Fire Extinguisher
☐ Fire Watch ☐Fire Blanket ☐ Other, Specify: _____

7. Condition or Area and Equipment Required

Yes	No	THESE KEY POINTS MUST BE CHECKED
		a. Lines disconnected blanked or if disconnecting is not possible blinds installed
		b. Lines steamed, purged, or otherwise properly cleared of combustibles?
		c. Area and equipment satisfactory clean of oil or combustibles?
		d. Trenches, catch basins sewer connections properly covered or sealed?
		e. Immediate areaand/or area under the work barricaded or roped off?
		f. Adjoining equip. operations checked to have any effect on the job?
		g. Area fire suppression (fire water and sprinkler system) in service?

Comments

Attachment L

Generic Community Air Monitoring Program

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the _____ levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored **continuously** at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 20, 2000

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APPENDIX E

CITIZEN PARTICIPATION PLAN

ASTRO ELECTROPLATING, INC.

Citizen Participation Plan

170 Central Avenue
Farmingdale, New York

NYSDEC SITE CODE #1-52-036

N&P JOB NO. 96033

March, 2002
Revised June, 2003

CITIZEN PARTICIPATION PLAN

1.0 Citizen Participation Definition

NYSDEC defines Citizen Participation (CP) in the context of hazardous waste site remediation as:

> "A program of planning and activities to encourage communication among people affected by or interested in hazardous waste sites and the government agencies responsible for investigating and remediating them. The overall goal is the development of timely, effective site remedial programs which protect people and the environment."

2.0 Citizen Participation Plan Goals

2.1 Definition of Public

The NYSDEC Division of Environmental Remediation (DER) has learned that, in the context of hazardous waste site remediation, the "public" is not a homogeneous, generalized mass. The public encompasses any particular individual, organization, business or government official who is interested in, or affected by, a specific hazardous waste site and its remedial program.

It is a primary goal of this CP plan to effectively define those individuals, businesses, organization and government officials who will be interested in this RD/RA process and its related activities.

At the request of NYSDEC officials on this project, a list of the names and addresses of adjacent, nearby affected parties such as residents, property owners and commercial establishments within a one (1) mile radius of the site has been compiled. This one mile radius area can be seen in **Figure 1** and the list of the current interested parties names and addresses **Attachment A**.

It has been agreed upon by Nelson & Pope Engineering and NYSDEC that the remainder of the interested party list shall be provided by NYSDEC. Other interested parties being composed of local officials, committees and boards; county/regional officials, boards and organizations; state officials and agencies; federal officials and agencies; civic, environmental, and recreational groups; economic interests and local and regional media.

It is also a goal of this CP plan to inform the "public" of the RD/RA activities and results. Initial contact will be made with the public through a mailing to all parties which have been compiled in the list.

Figure 1

2.2 Mailing of Informational Notices

Another goal of the CP is to provide all people on the interested party list with an informational notice (see Figure 10). This notice shall contain several points of information pertinent to the Astro Electroplating RD/RA activities. The key points to be incorporated into this notice are as follows:

- Brief site history and overall contamination description.
- NYSDEC site classification and definition
- Remedial investigation definition and description.
- Highlight summary of key elements for RD/RA.
- Announcement and location of document repositories.
- Addresses and names of NYSDEC and SCDHS contact people for additional information
- Site location map.

3.0 CITIZEN PARTICIPATION MEASURES

The Remedial Design Plan will be placed into the information repositories (see information repositories). A fact-sheet, describing the Remedial Design will be produced and disseminated to those on the public Contact List. Notification will also be through a NYSDEC press notice to Newsday's "Government Watch" and the local weeklies. Notification through the meeting invitation/fact sheet will be at least two weeks in advance.

A copy of the Remedial Design Plan will be placed in the information repositories and a fact-sheet will be disseminated to the public contact list.

4.0 PUBLIC CONTACT LISTINGS

Federal

Charles Schumer, United States Senator
757 Third Avenue, Suite 17-02
New York, New York 10017

Hillary Rodham Clinton, United States Senator
405 Lexington Avenue, 62nd Floor
New York, New York 10174

Steve Israel, United States Congressman
7 West Main Street
Bay Shore, New York 11706

State

The Honorable John Conte
New York State Assembly
1783 New York Avenue
Huntington Station, New York 11748

The Honorable Charles Fuschillo
New York State Senate
30 S. Ocean Ave Room 305
Freeport, NY 11520
Owen H. Johnson, State Senator
23-24 Argyle Street
Babylon, New York 11702

Tara King
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7015

Norman Levy, State Senator
SUNY Farmingdale Campus
Campus Commons Building #6
Route 110
Farmingdale, New York 11735

Robert K. Sweeney, State Assemblyman
270-B North Wellwood Avenue
Lindenhurst, New York 11757

Chittibabu Vasudevan
New York State Department of Environmental Conservation
Division of Environmental Remediation
50 Wolf Road, Albany, New York 12233

County

Robert J. Gaffney, Suffolk County Executive
888 Veterans Memorial Highway
POB 6100, Hauppauge, New York 11788

David Bishop, Suffolk County Legislator
276 North Wellwood Avenue
Lindenhurst, New York 11757

Maxine Postal, County Legislator
15 Albany Avenue
Amityville, New York 11701

Ms. Alice Amrhein
Commissioner
Suffolk County Dept. Economic Development
PO Box 6100
Hauppauge, NY 11788

Dr. Clare Bradley
Commissioner
Suffolk County Department of Health Services
225 Rabro Drive East
Hauppauge, NY 11788

Mr. Charles Bartha
Commissioner
Suffolk County Department of Public Works
335 Yaphank Ave.
Yaphank, NY 11980

Mr. James Bagg
Suffolk County Council on Environmental Quality
220 Rabro Drive
Hauppauge, NY 11788

Mr. Joseph Sanseverino
Commissioner
Suffolk County Dept of Community Development
PO Box 6100
Hauppauge, NY 11788

Town

Richard H. Schaffer, Supervisor, Town of Babylon and
Town Councilpersons
200 East Sunrise Highway
North Lindenhurst, New York 11757

Ronald Kluesener, Commissioner
Town of Babylon Department of Environmental Control
281 Phelps Lane, North Babylon, New York 11703
Sandra Bachety
Babylon Industrial Development Agency

57 West Sunrise Highway
Lindenhurst, New York 11757

Roy Stoecker, Chairperson, Town of Babylon Environmental Commission and
Robert Clifford, Town of Babylon Department of Public Information
200 East Sunrise Highway, North Lindenhurst, New York 11757-2598

Gil Hanse
Town of Babylon Fire Commission
281 Phelps Lane
North Babylon, New ?York 11703

The Honorable Francine Browning
Babylon Town Council
200 E. Sunrise Highway
North Lindenhurst, NY 11757

The Honorable Steven Bellone
Babylon Town Council
200 E. Sunrise Highway
North Lindenhurst, New York 11757

The Honorable Ellen McVeety
Babylon Town Council
200 E. Sunrise Hwy
North Lindenhurst, NY 11757

The Honorable Wayne Horsley
Babylon Town Council
200 E. Sunrise Highway
North Lindenhurst, NY 11757

Proximate Town, Village

Lewis Yevoli, Supervisor
Town of Oyster Bay
Town Hall, Oyster Bay, New York 11771

Carl L. Leupold, Commissioner
Town of Oyster Bay, Department of Public Works
150 Miller Place
Syosset, New York 11791

Phillis Barry, Town of Oyster Bay Public Information Officer
54 Audrey Avenue
Oyster Bay, New York 11771

Joseph Trudden, Mayor
Village of Farmingdale
361 Main Street
Farmingdale, New York 11735

Public Interest Groups

Babylon League of Woman Voters
211 Washington Avenue
Amityville, New York 11701

Jeff Fullmer, Co-Chairperson
Long Island Citizens Advisory committee on Hazardous Waste
C/o Citizens Campaign for the Environment
225 Main Street, Farmingdale, New York 11735

Rosemary Konatich, Co-Chairperson
Long Island Citizens Campaign for the Environment
Water Resource Commission
c/o NYS Legislative Commission
Suite 213, 11 Middle Neck Road
Great Neck, New York 11021

Patrick Cunningham, Vice President
Woodland Civic Association
10 Oak Street, Farmingdale, New York 11735

Elsa Ford
Suffolk PTA
18 Stockton Street
Brentwood, New York 11717

Phil and Diane Losduro
Citizens for Pure Water
7 Pleasant Avenue
South Farmingdale, New York 11735

Ernst Thompson, Kiwanis Club
23 Graham Street
Farmingdale, New York 11735

Ms. Caroline Mammarella
Suffolk County Community Alliance
PO Box 1382
West Babylon, NY 11704

Ms. Geri Barish
1 in 9: The Long Island Breast Cancer Coalition
2201 Hempstead Turnpike
East Meadow, NY 11554

Ms. Mary Anne Maddock
Long Island C.A.N.
45 Everett Street
Valley Stream, NY 11580

Dr. Sarah Meyland
Citizens Campaign for Environment
225 Main Street
Farmingdale, NY 11735

Other

Greg James, Chief
East Farmingdale Fire Department
930 Conklin Street
East Farmingdale, New York 11735

Lee Daniels, President
Farmingdale Chamber of Commerce
670 Conklin Street
Farmingdale, New York 11735

Michael LaGrande, Chairman
Suffolk County Water Authority
4060 Sunrise Highway
Oakdale, New York 11769

Judith Jakobson, Source Reduction Specialist
(address same as above)

John Ferrari Supt.
East Farmingdale Water District
72 Gazza Boulevard
Farmingdale, New York 11735

Mr. Gerald McCormack
Chairperson
South Farmingdale Water District
PO Box 3319
Farmingdale, NY 11735
Mr. George Winter
Farmingdale Chamber of Commerce
457 Main Street
Farmingdale, NY 11735

Mr. Frank Costanza
Long Island Advance
Editor
20 Medford Ave
Patchogue, NY 11772

Mr. Jack Scherer
Farmingdale Water Department
361 Main Street
Farmingdale, NY 11735

School

District

Dr. Kevin McGuire, Superintendent
Half Hollow Hills School District
524 Half Hollow Road
Dix Hills, New York 11746

Ms. Smith, Principal
West Hollow Middle School
250 Old East Neck Road
Melville, New York 11747

Lisa Streisand
President
Parent Teachers Association
(address same as above)

Media

Ms. Kathy McCullough
Long Island Business News

2150 Smithtown Avenue
Ronkonkoma, NY 11779

Government Watch Section
Newsday, 235 Pinelawn Road
Melville, New York 11747

Suffolk Life
PO Box 167, Riverhead, New York 11901
Attention: Lou Grasso

Farmingdale Observer
135 Liberty Avenue
Farmingdale, New York 11735

Ms. Barbara Jarvie
Managing Editor
Long Island Community News Group
216 E. 2nd Street
Mineola, New York 11501

Plainview-Old Bethpage Herald
132 E. 2nd Street
Mineola, New York 11501

News12 Long Island
Assignment Desk
1 Media Crossways
Woodbury, New York 11797

Ms. Susan Pela
South Shore Express
PO Box 468
Brightwaters, New York 11718

Newsday
Assignment Desk
235 Pinelawn Road
Melville, New York 11747

Ms. Betsy Vondrasek
Melville Boulevard Civic Association
25 Melville Road
South Huntington Station, NY

Babylon Beacon
Assignment Desk
PO Box 670
Babylon, NY 11702

This Week
425 Smith Street
Farmingdale, New York 11735

Residents in the Area of the Site

This will include all residents in the area bounded on the west by New Highway/Republic Road, on the north by Marcus Road on a line extending to Little East Neck Road as the eastern boundary, and on the south by Conklin Street and Long Island Avenue.

Additional people and organizations, as these express interest in the site by telephone contacts, writing, etc., will be included on the Contact List.

5.0 INFORMATION REPOSITORIES

These are placed where people can go to read the public documents relevant to the site. The repositories are located at:

Half Hollow Hills Community Library
510 Sweet Hollow Road
Melville, New York 11747
Attention: Reference Department
(631) 421-4535
Hours: Mon-Thurs 10-9, Fri, Sat 10-5

NYSDEC Region 1 Office
Environmental Remediation Unit
SUNY Campus, Building 40
Stony Brook, New York 11790-2356
Attention: Bill Fonda (631) 444-0249
Hours: 8:30-4:45, Mon-Fri

6.0 CONTACTS FOR FURTHER INFORMATION

Those individuals interested in obtaining more information regarding the RD/RA activities should contact the individuals listed below.

Tara King
NYSDEC Project Manager
NYSDEC Central Office, 625 Broadway, 11th Floor, Albany, New York 12233-7015
(518) 402-9621

Bill Fonda
NYSDEC Citizen Participation Specialist
NYSDEC Region One Office, SUNY Campus, Building 40, Stony Brook, New York 11790
(631) 444-0249

On Health-Related Matters

Jackie Nealon Environmental Health Specialist
NYSDOH Flanigan Square, 547 River Street, Troy, New York 12180-2216
(518) 402-7880

Attachment A

Generic Community Air Monitoring Plan

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

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All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 20, 2000

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APPENDIX E

CITIZEN PARTICIPATION PLAN

ASTRO ELECTROPLATING, INC.

Citizen Participation Plan

170 Central Avenue
Farmingdale, New York

NYSDEC SITE CODE #1-52-036

N&P JOB NO. 96033

March, 2002
Revised June, 2003

CITIZEN PARTICIPATION PLAN

1.0 Citizen Participation Definition

NYSDEC defines Citizen Participation (CP) in the context of hazardous waste site remediation as:

> "A program of planning and activities to encourage communication among people affected by or interested in hazardous waste sites and the government agencies responsible for investigating and remediating them. The overall goal is the development of timely, effective site remedial programs which protect people and the environment."

2.0 Citizen Participation Plan Goals

2.1 Definition of Public

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It has been agreed upon by Nelson & Pope Engineering and NYSDEC that the remainder of the interested party list shall be provided by NYSDEC. Other interested parties being composed of local officials, committees and boards; county/regional officials, boards and organizations; state officials and agencies; federal officials and agencies; civic, environmental, and recreational groups; economic interests and local and regional media.

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Another goal of the CP is to provide all people on the interested party list with an informational notice (see Figure 10). This notice shall contain several points of information pertinent to the Astro Electroplating RD/RA activities. The key points to be incorporated into this notice are as follows:

- Brief site history and overall contamination description.
- NYSDEC site classification and definition
- Remedial investigation definition and description.
- Highlight summary of key elements for RD/RA.
- Announcement and location of document repositories.
- Addresses and names of NYSDEC and SCDHS contact people for additional information
- Site location map.

3.0 CITIZEN PARTICIPATION MEASURES

The Remedial Design Plan will be placed into the information repositories (see information repositories). A fact-sheet, describing the Remedial Design will be produced and disseminated to those on the public Contact List. Notification will also be through a NYSDEC press notice to Newsday's "Government Watch" and the local weeklies. Notification through the meeting invitation/fact sheet will be at least two weeks in advance.

A copy of the Remedial Design Plan will be placed in the information repositories and a fact-sheet will be disseminated to the public contact list.

4.0 PUBLIC CONTACT LISTINGS

Federal

Charles Schumer, United States Senator
757 Third Avenue, Suite 17-02
New York, New York 10017

Hillary Rodham Clinton, United States Senator
405 Lexington Avenue, 62nd Floor
New York, New York 10174

Steve Israel, United States Congressman
7 West Main Street
Bay Shore, New York 11706

State

The Honorable John Conte
New York State Assembly
1783 New York Avenue
Huntington Station, New York 11748

The Honorable Charles Fuschillo
New York State Senate
30 S. Ocean Ave Room 305
Freeport, NY 11520
Owen H. Johnson, State Senator
23-24 Argyle Street
Babylon, New York 11702

Tara King
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7015

Norman Levy, State Senator
SUNY Farmingdale Campus
Campus Commons Building #6
Route 110
Farmingdale, New York 11735

Robert K. Sweeney, State Assemblyman
270-B North Wellwood Avenue
Lindenhurst, New York 11757

Chittibabu Vasudevan
New York State Department of Environmental Conservation
Division of Environmental Remediation
~~50 Wolf Road~~, Albany, New York 12233-7015
625 Broadway

County

Robert J. Gaffney, Suffolk County Executive
888 Veterans Memorial Highway
POB 6100, Hauppauge, New York 11788

David Bishop, Suffolk County Legislator
276 North Wellwood Avenue
Lindenhurst, New York 11757

Maxine Postal, County Legislator
15 Albany Avenue
Amityville, New York 11701

Ms. Alice Amrhein
Commissioner
Suffolk County Dept. Economic Development
PO Box 6100
Hauppauge, NY 11788

Dr. Clare Bradley
Commissioner
Suffolk County Department of Health Services
225 Rabro Drive East
Hauppauge, NY 11788

Mr. Charles Bartha
Commissioner
Suffolk County Department of Public Works
335 Yaphank Ave.
Yaphank, NY 11980

Mr. James Bagg
Suffolk County Council on Environmental Quality
220 Rabro Drive
Hauppauge, NY 11788

Mr. Joseph Sanseverino
Commissioner
Suffolk County Dept of Community Development
PO Box 6100
Hauppauge, NY 11788

Town

Richard H. Schaffer, Supervisor, Town of Babylon and
Town Councilpersons
200 East Sunrise Highway
North Lindenhurst, New York 11757

Ronald Kluesener, Commissioner
Town of Babylon Department of Environmental Control
281 Phelps Lane, North Babylon, New York 11703
Sandra Bachety
Babylon Industrial Development Agency

57 West Sunrise Highway
Lindenhurst, New York 11757

Roy Stoecker, Chairperson, Town of Babylon Environmental Commission and
Robert Clifford, Town of Babylon Department of Public Information
200 East Sunrise Highway, North Lindenhurst, New York 11757-2598

Gil Hanse
Town of Babylon Fire Commission
281 Phelps Lane
North Babylon, New ?York 11703

The Honorable Francine Browning
Babylon Town Council
200 E. Sunrise Highway
North Lindenhurst, NY 11757

The Honorable Steven Bellone
Babylon Town Council
200 E. Sunrise Highway
North Lindenhurst, New York 11757

The Honorable Ellen McVeety
Babylon Town Council
200 E. Sunrise Hwy
North Lindenhurst, NY 11757

The Honorable Wayne Horsley
Babylon Town Council
200 E. Sunrise Highway
North Lindenhurst, NY 11757

Proximate Town, Village

Lewis Yevoli, Supervisor
Town of Oyster Bay
Town Hall, Oyster Bay, New York 11771

Carl L. Leupold, Commissioner
Town of Oyster Bay, Department of Public Works
150 Miller Place
Syosset, New York 11791

Phillis Barry, Town of Oyster Bay Public Information Officer
54 Audrey Avenue
Oyster Bay, New York 11771

Joseph Trudden, Mayor
Village of Farmingdale
361 Main Street
Farmingdale, New York 11735

Public Interest Groups

Babylon League of Woman Voters
211 Washington Avenue
Amityville, New York 11701

Jeff Fullmer, Co-Chairperson
Long Island Citizens Advisory committee on Hazardous Waste
C/o Citizens Campaign for the Environment
225 Main Street, Farmingdale, New York 11735

Rosemary Konatich, Co-Chairperson
Long Island Citizens Campaign for the Environment
Water Resource Commission
c/o NYS Legislative Commission
Suite 213, 11 Middle Neck Road
Great Neck, New York 11021

Patrick Cunningham, Vice President
Woodland Civic Association
10 Oak Street, Farmingdale, New York 11735

Elsa Ford
Suffolk PTA
18 Stockton Street
Brentwood, New York 11717

Phil and Diane Losduro
Citizens for Pure Water
7 Pleasant Avenue
South Farmingdale, New York 11735

Ernst Thompson, Kiwanis Club
23 Graham Street
Farmingdale, New York 11735

Ms. Caroline Mammarella
Suffolk County Community Alliance
PO Box 1382
West Babylon, NY 11704

Ms. Geri Barish
1 in 9: The Long Island Breast Cancer Coalition
2201 Hempstead Turnpike
East Meadow, NY 11554

Ms. Mary Anne Maddock
Long Island C.A.N.
45 Everett Street
Valley Stream, NY 11580

Dr. Sarah Meyland
Citizens Campaign for Environment
225 Main Street
Farmingdale, NY 11735

Other

Greg James, Chief
East Farmingdale Fire Department
930 Conklin Street
East Farmingdale, New York 11735

Lee Daniels, President
Farmingdale Chamber of Commerce
670 Conklin Street
Farmingdale, New York 11735

Michael LaGrande, Chairman
Suffolk County Water Authority
4060 Sunrise Highway
Oakdale, New York 11769

Judith Jakobson, Source Reduction Specialist
(address same as above)

John Ferrari Supt.
East Farmingdale Water District
72 Gazza Boulevard
Farmingdale, New York 11735

Mr. Gerald McCormack
Chairperson
South Farmingdale Water District
PO Box 3319
Farmingdale, NY 11735

SPACE

Mr. George Winter
Farmingdale Chamber of Commerce
457 Main Street
Farmingdale, NY 11735

Mr. Frank Costanza
Long Island Advance
Editor
20 Medford Ave
Patchogue, NY 11772

Mr. Jack Scherer
Farmingdale Water Department
361 Main Street
Farmingdale, NY 11735

School

District

Dr. Kevin McGuire, Superintendent
Half Hollow Hills School District
524 Half Hollow Road
Dix Hills, New York 11746

Ms. Smith, Principal
West Hollow Middle School
250 Old East Neck Road
Melville, New York 11747

Lisa Streisand
President
Parent Teachers Association
(address same as above)

Media

Ms. Kathy McCullough
Long Island Business News

2150 Smithtown Avenue
Ronkonkoma, NY 11779

Government Watch Section
Newsday, 235 Pinelawn Road
Melville, New York 11747

Suffolk Life
PO Box 167, Riverhead, New York 11901
Attention: Lou Grasso

Farmingdale Observer
135 Liberty Avenue
Farmingdale, New York 11735

Ms. Barbara Jarvie
Managing Editor
Long Island Community News Group
216 E. 2nd Street
Mineola, New York 11501

Plainview-Old Bethpage Herald
132 E. 2nd Street
Mineola, New York 11501

News12 Long Island
Assignment Desk
1 Media Crossways
Woodbury, New York 11797

Ms. Susan Pela
South Shore Express
PO Box 468
Brightwaters, New York 11718

Newsday
Assignment Desk
235 Pinelawn Road
Melville, New York 11747

Ms. Betsy Vondrasek
Melville Boulevard Civic Association
25 Melville Road
South Huntington Station, NY

Babylon Beacon
Assignment Desk
PO Box 670
Babylon, NY 11702

This Week
425 Smith Street
Farmingdale, New York 11735

Residents in the Area of the Site

This will include all residents in the area bounded on the west by New Highway/Republic Road, on the north by Marcus Road on a line extending to Little East Neck Road as the eastern boundary, and on the south by Conklin Street and Long Island Avenue.

Additional people and organizations, as these express interest in the site by telephone contacts, writing, etc., will be included on the Contact List.

5.0 INFORMATION REPOSITORIES

These are placed where people can go to read the public documents relevant to the site. The repositories are located at:

Half Hollow Hills Community Library
510 Sweet Hollow Road
Melville, New York 11747
Attention: Reference Department
(631) 421-4535
Hours: Mon-Thurs 10-9, Fri, Sat 10-5

NYSDEC Region 1 Office
Environmental Remediation Unit
SUNY Campus, Building 40
Stony Brook, New York 11790-2356
Attention: Bill Fonda (631) 444-0249
Hours: 8:30-4:45, Mon-Fri

6.0 CONTACTS FOR FURTHER INFORMATION

Those individuals interested in obtaining more information regarding the RD/RA activities should contact the individuals listed below.

Tara King
NYSDEC Project Manager
NYSDEC Central Office, 625 Broadway, 11th Floor, Albany, New York 12233-7015
(518) 402-9621

Bill Fonda
NYSDEC Citizen Participation Specialist
NYSDEC Region One Office, SUNY Campus, Building 40, Stony Brook, New York 11790
(631) 444-0249

On Health-Related Matters

Jackie Nealon, Environmental Health Specialist
NYSDOH Flanigan Square, 547 River Street, Troy, New York 12180-2216
(518) 402-7880

EXTRACTION WELL AND CAPPING SYSTEM
PLANS AND DETAILS
FOR
ASTRO ELECTROPLATING, INC.
SITUATED AT
FARMINGDALE
TOWN OF BABYLON
SUFFOLK COUNTY, NEW YORK

1. NELSON & POPE SHALL NOT BE RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, OR PROCEDURES UTILIZED BY THE CONTRACTOR, NOR FOR THE SAFETY OF THE PUBLIC OR THE CONTRACTORS' EMPLOYEES, OR FOR THE FAILURE OF THE CONTRACTOR TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. ALL EXISTING STRUCTURES WHICH ARE TO BE REMOVED SHALL BE BACKFILLED WITH SELECT GRANULAR FILL WHICH HAS BEEN COMPACTED TO A 95% MAXIMUM DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY A MODIFIED PROCTOR TEST.
3. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES BY PERFORMING A FIELD INSPECTION. THE ENGINEER SHALL BE NOTIFIED OF ANY CONFLICTS BETWEEN EXISTING UTILITIES AND THE PROPOSED WORK, PRIOR TO THE START OF CONSTRUCTION.
4. ALL OTHER WORK PERFORMED SHALL BE IN ACCORDANCE WITH THE TOWN OF BABYLON, SUFFOLK COUNTY OR A SPECIFIED HEREIN, LATEST EDITIONS.
5. INSTALLATION OF THE ELECTRIC SERVICE IS THE RESPONSIBILITY OF THE CONTRACTOR, BY WHICH ALL WORK SHALL CONFORM, AS A MINIMUM TO THE REQUIREMENTS OF THE KEYSPAN ENERGY.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS NECESSARY FOR THE INSTALLATION OF ALL UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING ALL REQUIREMENTS FOR PRE-CONSTRUCTION OF ANY SANITARY SYSTEM FROM ALL GOVERNING AGENCIES. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF ALL THE UTILITIES OR MUNICIPAL AGENCIES HAVING JURISDICTION. THE CONTRACTOR SHALL COORDINATE THE REQUIRED UTILITY AND MUNICIPAL INSPECTIONS.
7. DEBRIS SHALL NOT BE BURIED ON THE SUBJECT SITE. ALL UNSUITABLE MATERIAL AND DEBRIS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL TOWN, COUNTY, STATE AND FEDERAL LAW AND APPLICABLE CODES.
8. ELEVATIONS REFER TO NGVD DATUM.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY AND ALL PERMITS NECESSARY TO REMOVE ANY EXCAVATED OR DEMOLISHED MATERIAL.
10. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS TO ALLOW FOR CLEARING AND GRUBBING OF THE SITE.

ELECTRICAL NOTES

1. ALL WORK SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE (NEC), THE LONG ISLAND POWER AUTHORITY (LIPA), KEYSPAN ENERGY AND ANY OTHER GOVERNING CODES AND STANDARDS.
2. THE CONTRACTOR SHALL COMPLY WITH THE LAWS, RULES AND REGULATIONS OF THE STATE, MUNICIPALITY AND DISTRICT DEPARTMENTS HAVING SUCH JURISDICTION.
3. ALL ELECTRICAL EQUIPMENT BEING INSTALLED SHALL BE UL APPROVED AND LABELED, WERE APPLICABLE.
4. ALL ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH ARTICLE 250 OF THE NATIONAL ELECTRIC CODE.
5. THE CONTRACTOR SHALL PAY FOR AND SECURE ALL UNDERWRITERS CERTIFICATES.
6. ALL WIRE AND CABLE SHALL BE 75 DEGREE C TYPE THW COPPER UNLESS OTHERWISE INDICATED. ALL CIRCUIT RUNS CONTAIN 2 WIRES UNLESS OTHERWISE NOTED.
7. COORDINATE THE LOCATION OF RECEPTACLES WITH THE ELECTRICAL DRAWINGS.
8. ALL SWITCHES AND RECEPTACLES SHOULD BE RECESSED EXCEPT FOR THOSE ON CONCRETE WALLS WHICH SHALL BE SURFACED MOUNTED.
9. POWER WIRING TO PLUMBING, HVAC AND MECHANICAL EQUIPMENT IS THE DIRECT RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, UNLESS OTHERWISE NOTED.
10. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL TEMPORARY LIGHTING AND POWER AS NECESSARY
11. THE ELECTRICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH THE OTHER TRADES AND ASSIST IN SCHEDULING HIS WORK IN ORDER TO COOPERATE WITH THE OTHER TRADES.
12. THE ELECTRICAL CONTRACTOR SHALL FURNISH SHOP DRAWINGS OF ALL REQUIRED ELECTRICAL PANELS, INCLUDING ELEMENTARY INTERNALS AND INTERCONNECTING WIRE DIAGRAMS.
13. THE ELECTRICAL CONTRACTOR SHALL FURNISH AS-BUILT ELECTRICAL DRAWINGS.

SHEET INDEX

UTILITY CONTACTS

SANITARY:	SUFFOLK COUNTY DEPARTMENT OF PUBLIC WORKS 335 YAPHANK AVENUE YAPHANK, NEW YORK 11980	ELECTRIC:	LONG ISLAND POWER AUTHORITY 1393 VETERANS MEMORIAL HIGHWAY HAUPPAUGE, NEW YORK 11972
WATER:	SUFFOLK COUNTY WATER AUTHORITY 260 MOTOR PARKWAY HAUPPAUGE, NEW YORK 11787	TELEPHONE:	VERIZON 501 N. OCEAN AVENUE PATCHOGUE, NEW YORK 11772
GAS:	BROOKLYN UNION GAS 112 WEST MAIN STREET PATCHOGUE, NEW YORK 11772	ROADS:	SUFFOLK COUNTY DEPARTMENT OF PUBLIC WORKS 335 YAPHANK AVENUE YAPHANK, NEW YORK 11980

REVISION BLOCK

2	REVISED PER NYSDEC COMMENTS DATED 06/20/03 (NO REVISIONS THIS SHEET)
1	REVISED PER NYSDEC COMMENTS DATED 11/05/02

STATE OF NEW YORK – ARTHUR J. POPE – LICENSED PROFESSIONAL ENGINEER
P.E. SEAL & SIGNATURE

COVER SHEET
FOR
ASTRO ELECTROPLATING, INC.
SITUATED AT
FARMINGDALE
TOWN OF BABYLON, SUFFOLK COUNTY, NEW YORK

NELSON & POPE
ENGINEERS · SURVEYORS
572 WALT WHITMAN ROAD, MELVILLE, N.Y. 11747-2188
(631) 427-5665 FAX (631) 425-1257

DWN. BY:	DRF
DSGN'D BY:	GCB
CHK'D BY:	TRL
DATE:	03/06/02
JOB No:	96033
FILE No:	-
CADD	96033COV
SCALE:	NONE
SHEET:	1 OF 5

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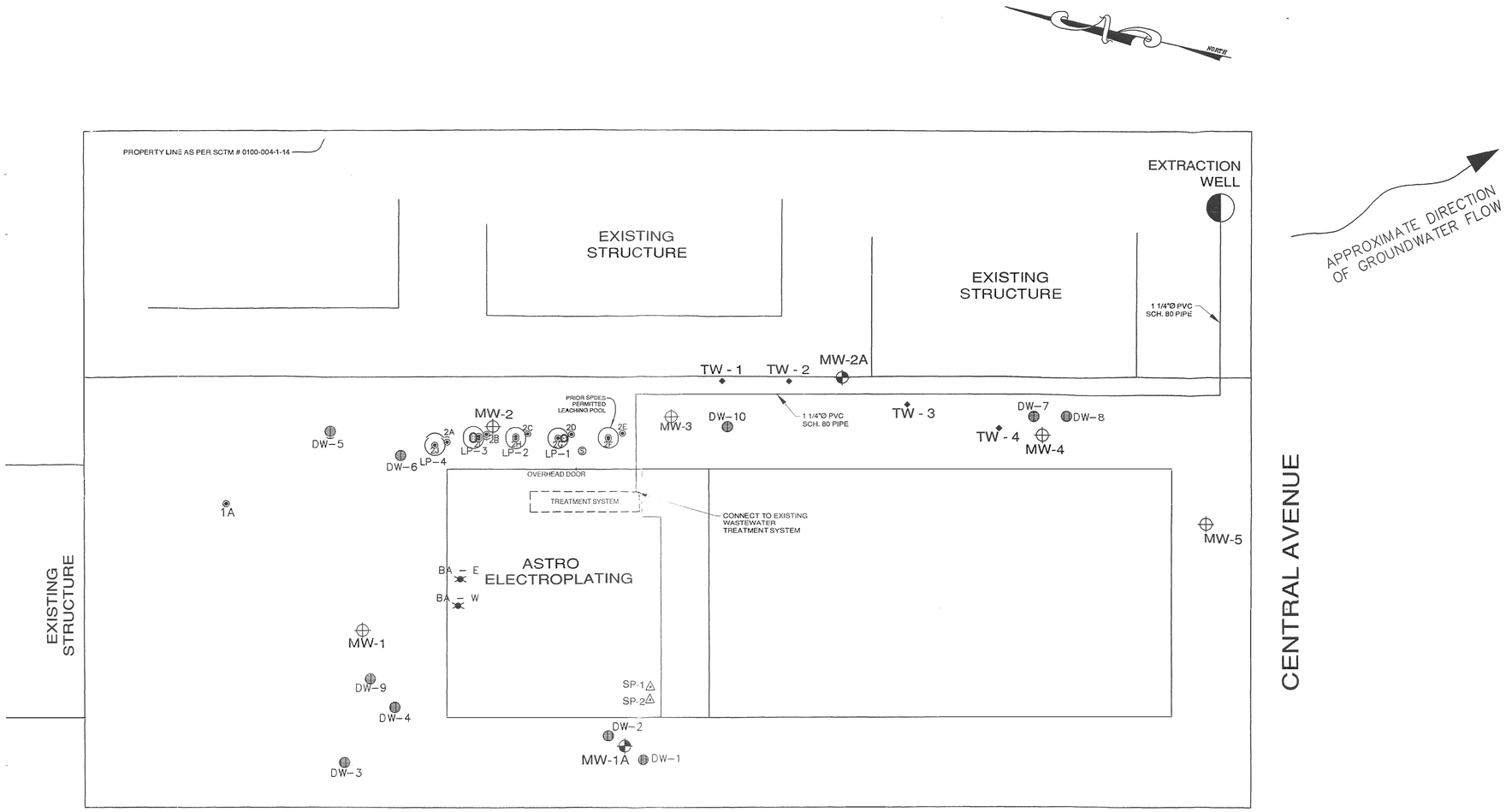


LEGEND

- PROPOSED MONITORING WELL
- EXISTING MONITORING WELL
- EXISTING SEWER MANHOLE
- EXISTING DRYWELL
- B.S. BELOW STANDARD
- ORIGINAL BORING
- INTERIOR PIT AS PER SCDHS
- GEOPROBE SAMPLE
- PROCESS FLOOR AREA
- TEMPORARY WELL (TW)
- EXTRACTION WELL

No.	DATE	REVISION	BY:
2	08/18/03	NO REVISIONS THIS SHEET	GCB/GCB
1	12/03/02	REVISED PER NYSDEC COMMENTS DATED 11/05/02	DRF/GCB

P.E. SEAL & SIGNATURE

EXTRACTION WELL SITE PLAN
FOR
ASTRO ELECTROPLATING, INC.
SITUATED AT
FARMINGDALE
TOWN OF BABYLON, SUFFOLK COUNTY, NEW YORK

DWN. BY:	DRF
DSGN'D BY:	GCB
CHK'D BY:	AJK
DATE:	03/06/02
JOB No:	96033
FILE No:	-
CADD	96033EWSP
SCALE:	NONE
SHEET:	2 OF 5

NELSON & POPE
ENGINEERS · SURVEYORS
572 WALT WHITMAN ROAD, MELVILLE, N.Y. 11747-2188
(631) 427-5665 FAX (631) 425-1267

CONTROL PANEL

A. Furnish and install a simplex pump control panel in a NEMA 4X stainless steel enclosure with quick operating latches for 208 volt, 3 phase, 60 cycle, 3 wire power supply.

B. Each pump motor will be supplied with a circuit breaker and an across the line NEMA rated motor starter with three phase overload protection.

C. The panel will include H.O.A. selector switches which shall allow for manual starting of the pump when switched into hand mode and automatic operation when in the automatic mode.

D. Indicator lights shall be provided for each alarm condition. Common alarm lights will be not be acceptable.

E. The level control system shall be through the use of two floats and a pipeline transducer.

F. Panel shall include a GFCI convenience receptacle protected by a 2OA CB and a thermostatically controlled heater for condensation protection.

G. Panel shall include a main disconnect with externally operable handle.

H. A running time meters shall be supplied for each pump.

I. Enclosure panels shall be provided with door stop kits to secure the outer door in the open position.

J. A Hayward Flowsite Model 2300 Flowmeter shall be installed within the control panel to provide for measurement of total flow pumped by the extraction well.

K. An Ashcroft pipeline pressure transducer shall be supplied by the control panel manufacturer and integrated into the pump control logic, such that in the event the pressure transducer does not register a increase in pipeline pressure in a specified period of time, that the control panel shutdown the pump. The control logic shall also be capable of shutting the pump off in the event that the pressure transducer registers zero pipeline pressure after the pump has been called to run.

L. A fault reset button shall be provided to clear all alarm conditions once the alarm problem has been corrected.

M. The panel face shall include light bulb indicators to display the following:

1. Individual pump run
2. Individual manual / off / automatic
3. Pump running
4. Low pressure

N. The pump controller shall provide volt free (dry contacts) relay outputs for the following:

1. Pump no. 1 failure
2. Low pressure

Floats

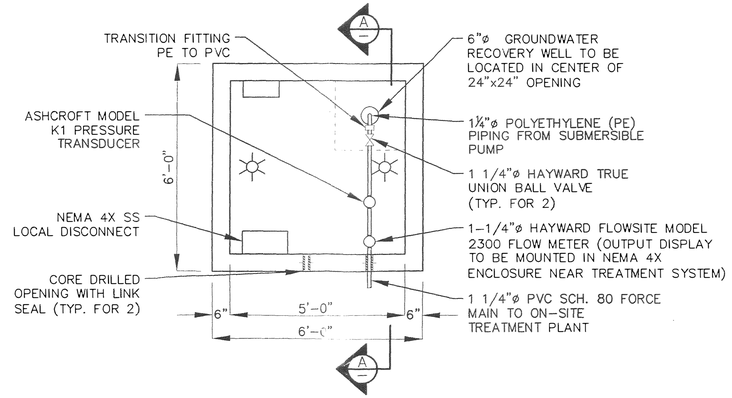
A. The floats casing shall be manufactured from polypropylene with the cable sheathed with a PVC compound.

B. The float shall contain a mechanical micro-switch which when activated shall close or break the circuit causing the circuit to activate the desired function.

C. The floats shall be rated for use in industrial wastewater applications.

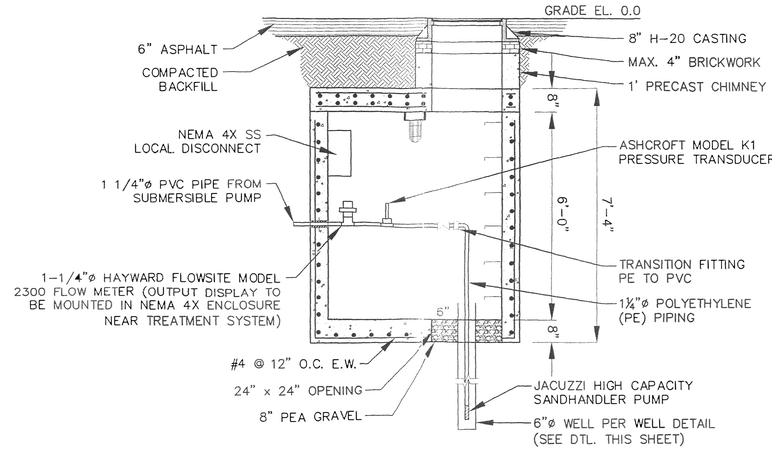
D. The regulator shall be rated for use in liquid with a temperature range of 32 degree F to 140 degree F.

E. A stainless steel cable and weight shall be provided as part of the float system. Each individual float shall be connected to a stainless steel cable to make one float tree system.



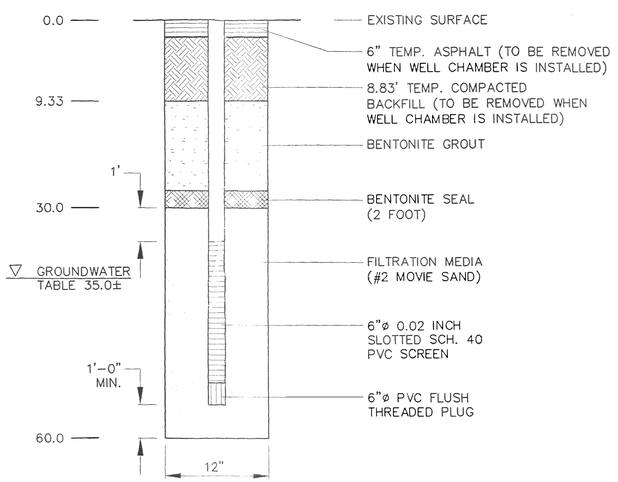
WELL CHAMBER PLAN

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



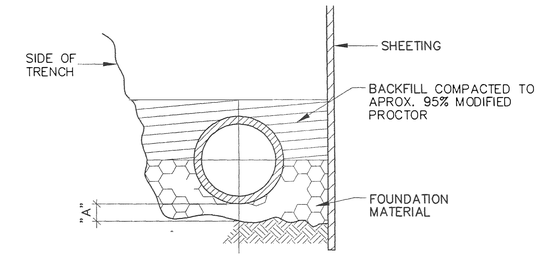
SECTION A-A

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



MONITORING WELL

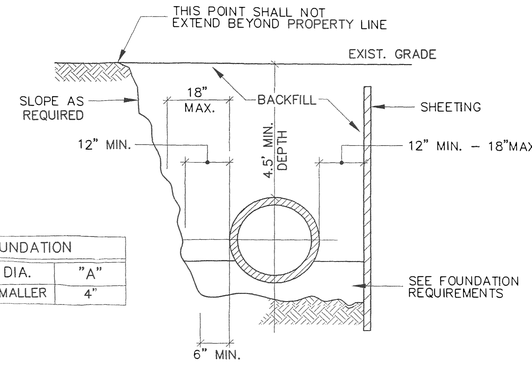
NOT TO SCALE



HALF SECTION UNSHEETED TRENCH

HALF SECTION SHEETED TRENCH

FOUNDATION MATERIAL ON EARTH



FOUNDATION	
PIPE DIA.	"A"
4" OR SMALLER	4"

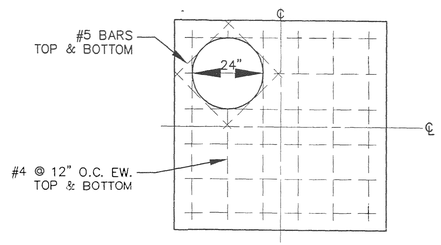
HALF SECTION UNSHEETED TRENCH

HALF SECTION SHEETED TRENCH

TRENCH IN EARTH

TRENCH DETAILS

N.T.S.



WELL CHAMBER TOP SLAB REINFORCING PLAN

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

NOTE:
WELL CHAMBER BOX AND TOP SLAB TO BE REINFORCED FOR H-20 LOADING CONDITIONS.

No.	DATE	REVISION	BY:
2	08/19/03	REVISED PER NYSDEC COMMENTS DATED 06/20/03	DRF/GCB
1	12/03/02	REVISED PER NYSDEC COMMENTS DATED 11/05/02	DRF/GCB

EXTRACTION WELL DETAILS
FOR
ASTRO ELECTROPLATING, INC.
SITUATED AT
FARMINGDALE
TOWN OF BABYLON, SUFFOLK COUNTY, NEW YORK

DWN. BY:	DRF
DSGN'D BY:	GCB
CHK'D BY:	AJK
DATE:	03/06/02
JOB No.:	96033
FILE No.:	-
CADD:	96033WELL
SCALE:	NOTED
SHEET	3 OF 5

P.E. SEAL & SIGNATURE

NELSON & POPE
ENGINEERS · SURVEYORS
572 WALT WHITMAN ROAD, MELVILLE, N.Y. 11747-2188
(631) 427-5665 FAX (631) 425-1257

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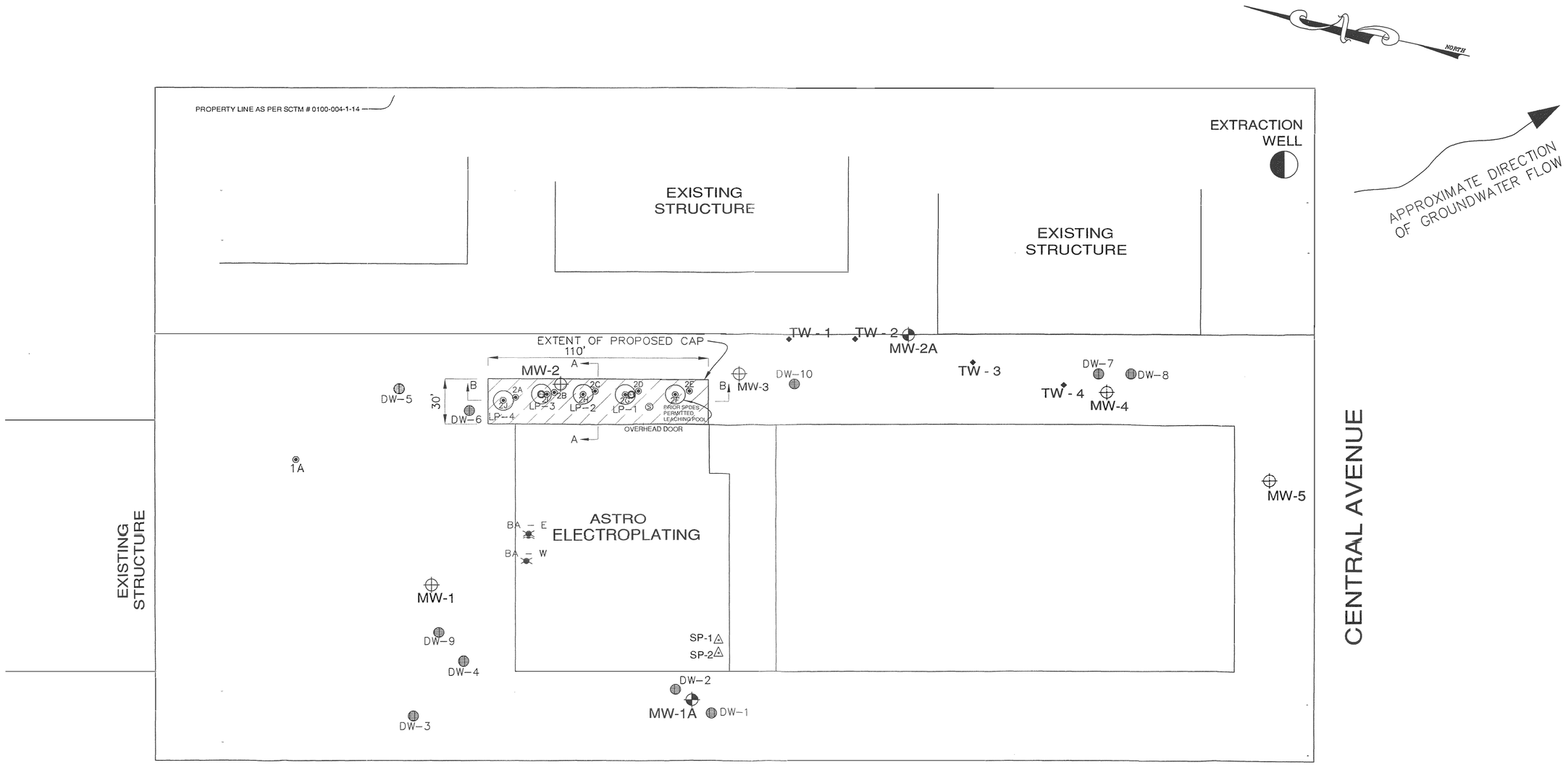

LEGEND

- PROPOSED MONITORING WELL
- EXISTING MONITORING WELL
- EXISTING SEWER MANHOLE
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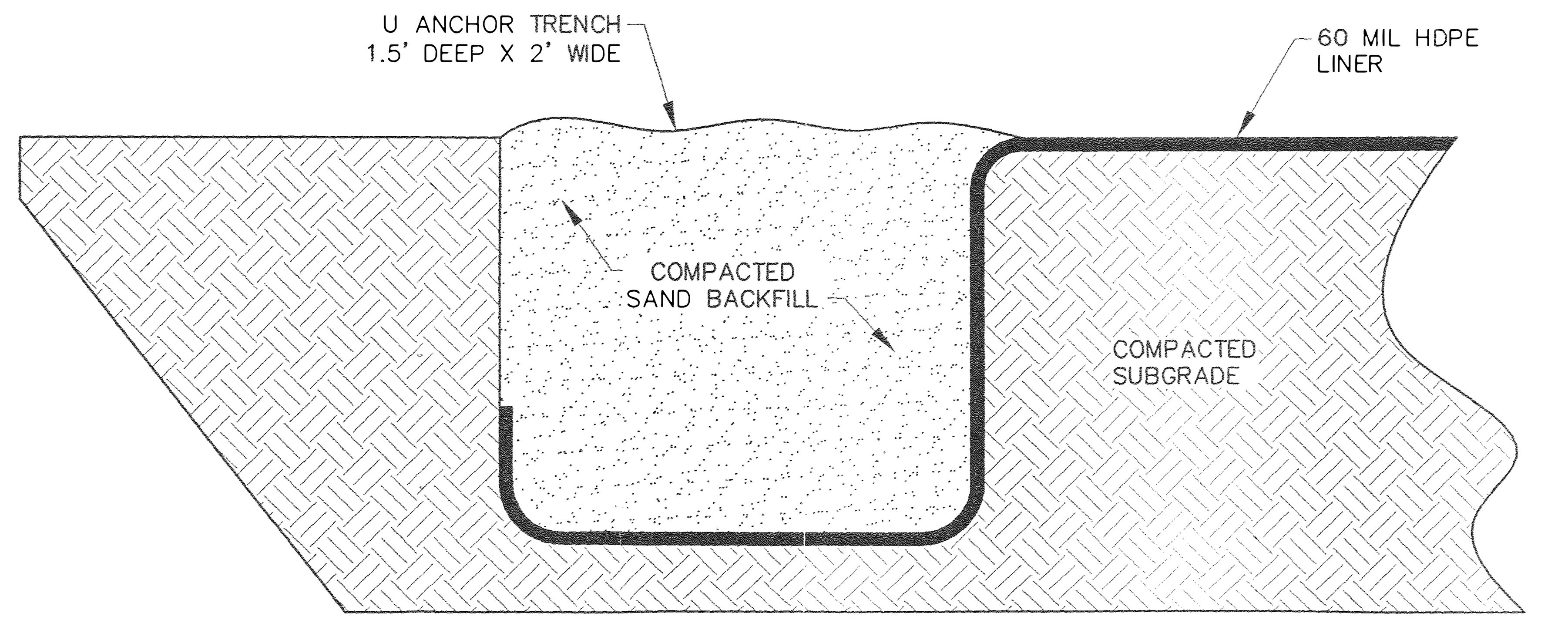
No.	DATE	REVISION	BY:
2	08/18/03	NO REVISIONS THIS SHEET	GCB/GCB
1	12/03/02	REVISED PER NYSDEC COMMENTS DATED 11/05/02	DRF/GCB

8/18/03
P.E. SEAL & SIGNATURE

CAPPING SITE PLAN
FOR
ASTRO ELECTROPLATING, INC.
SITUATED AT
FARMINGDALE
TOWN OF BABYLON, SUFFOLK COUNTY, NEW YORK

NELSON & POPE
ENGINEERS · SURVEYORS
572 WALT WHITMAN ROAD, MELVILLE, N.Y. 11747-2188
(631) 427-5665 FAX (631) 425-1257

DWN. BY:	DRF
DSGN'D BY:	GCB
CHK'D BY:	AJK
DATE:	03/06/02
JOB No.:	96033
FILE No.:	-
CADD:	96033CSP
SCALE:	NONE
SHEET	4 OF 5



U ANCHOR TRENCH

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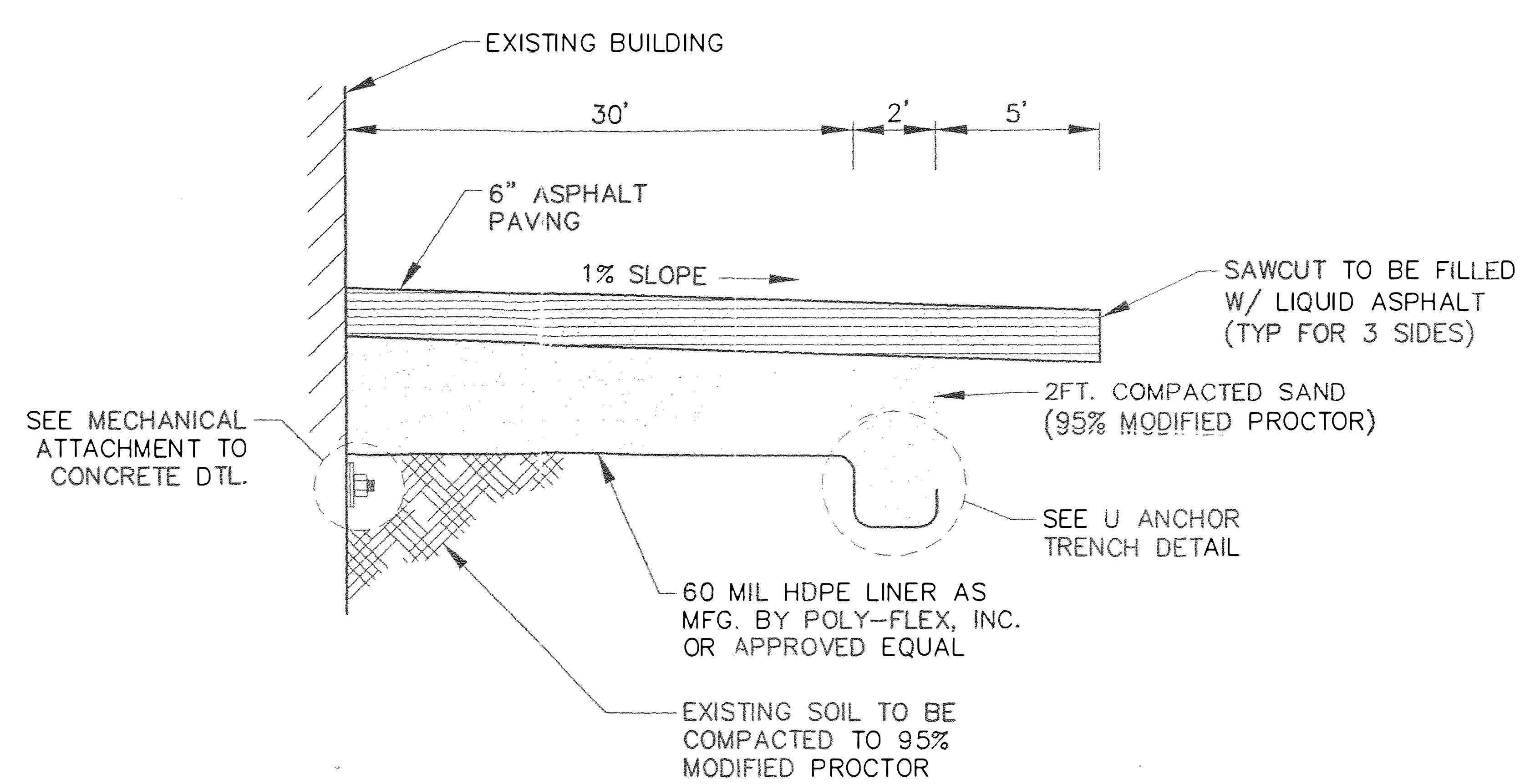

SECTION A–A

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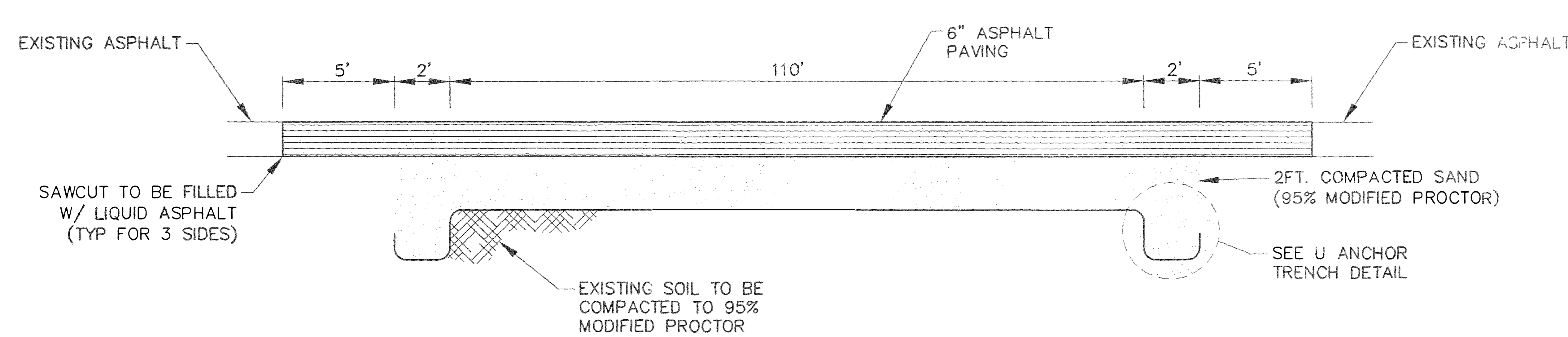

SECTION B–B

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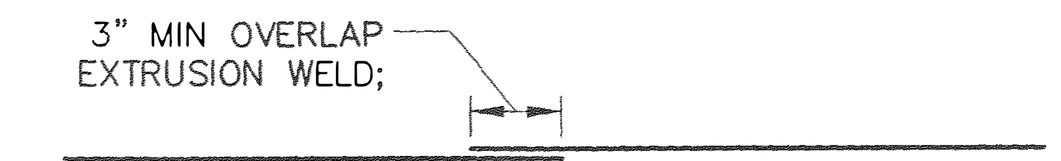
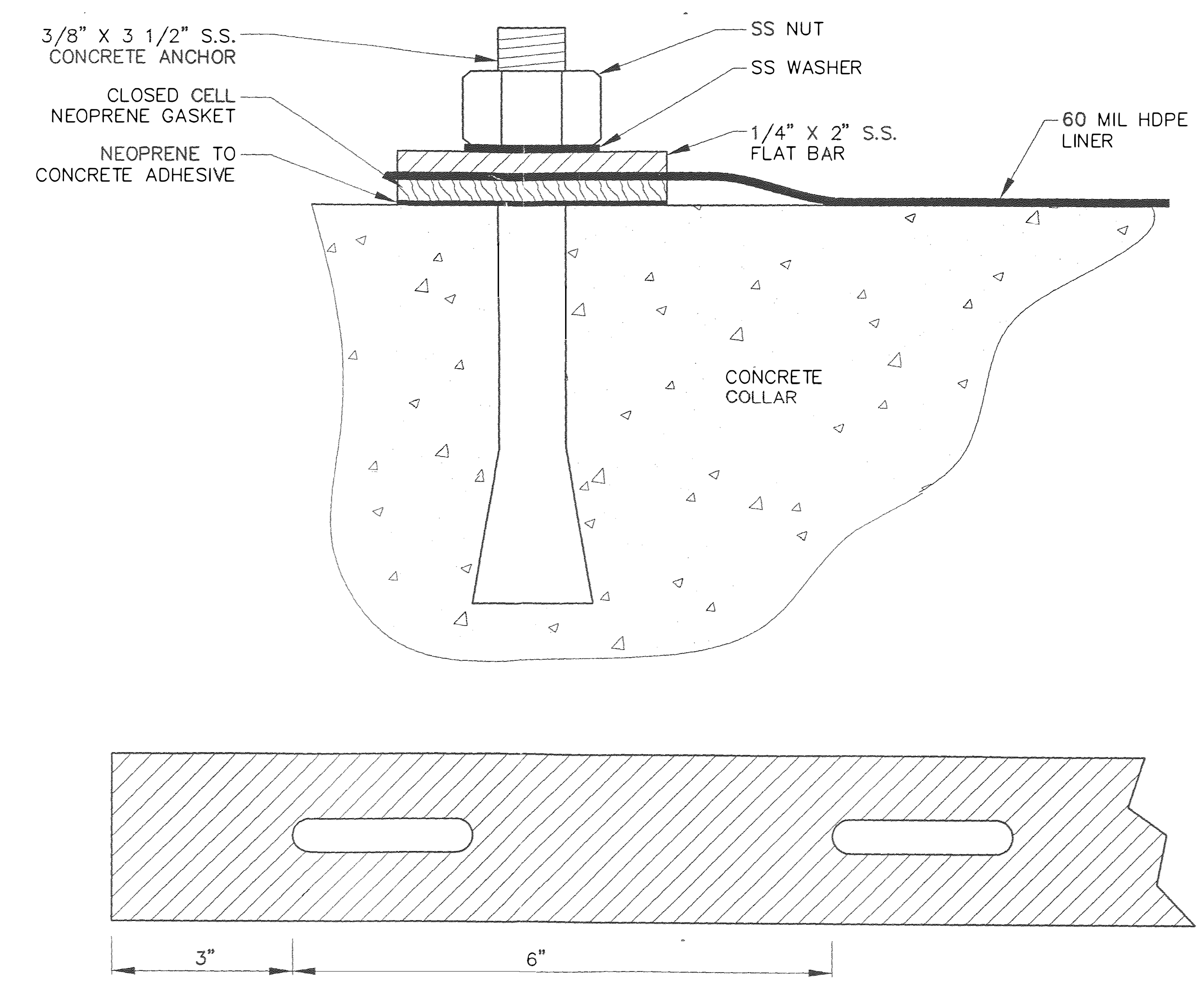


HDPE GEOMEMBRANE SEAM DETAIL

NOT TO SCALE

NOTES:

1. CONTRACTOR SHALL ORIENT SEAMS PARALLEL TO LINE OF SLOPE (DOWN AND NOT ACROSS SLOPE).
2. CONTRACTOR SHALL MINIMIZE THE NUMBER OF FIELD SEAMS IN CORNERS, ODD–SHAPED GEOMETRIC LOCATIONS AND OUTSIDE CORNERS.
3. SLOPE SEAMS SHALL EXTEND A MINIMUM OF FIVE FEET BEYOND THE GRADE BREAK INTO THE FLAT AREAS.
4. SEAMS SHALL BE EXTRUSION WELDED USING A METHOD APPROVED BY THE ENGINEER.
5. SEAMING SHALL NOT PROCEED WHEN AMBIENT AIR TEMPERATURE OR ADVERSE WEATHER CONDITIONS MAY JEOPARDIZE THE INTEGRITY OF THE LINER INSTALLATION.



MECHANICAL ATTACHMENT TO CONCRETE (SINGLE LINER)

NOT TO SCALE

No.	DATE	REVISION	BY:
2	08/18/03	NO REVISIONS THIS SHEET	GCB/GCB
1	12/03/02	NO REVISIONS THIS SHEET	DRF/GCB

P.E. SEAL & SIGNATURE

STATE OF NEW YORK · ARTHUR J. KOERBER · NO 47929 · LICENSED PROFESSIONAL ENGINEER

CAPPING DETAILS
FOR
ASTRO ELECTROPLATING, INC.
SITUATED AT
FARMINGDALE
TOWN OF BABYLON, SUFFOLK COUNTY, NEW YORK

NELSON & POPE
ENGINEERS · SURVEYORS
572 WALT WHITMAN ROAD, MELVILLE, N.Y. 11747–2188
(631) 427–5665 FAX (631) 425–1257

DWN. BY:	DRF
DSGN'D BY:	GCB
CHK'D BY:	AJK
DATE:	03/06/02
JOB No.:	96033
FILE No.:	-
CADD:	96033CAP
SCALE:	NOTED
SHEET:	5 OF 5