TECHNICAL PROPOSAL AND WORK PLAN FOR CHROMEX

CLOSURE OF PLATING FACILITY

April 5, 1991

Prepared for:

THE CHARLES LOWE COMPANY
1400 PARK AVENUE
EMERYVILLE, CA 94608

For Submittal To:

Alameda County Health Agency, Division of Hazardous Materials
and
East Bay Municipal Utility District

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SECTION I: INTRODUCTION

SITE HISTORY

Chromex is a division of the Charles Lowe Company located at 1400 Park Avenue in Emeryville, California. The Charles Lowe Company is a manufacturing firm that produces and repairs marine and industrial equipment. Chromex supported the manufacturing operations on-site by providing electroplating, metal spraying, and selective brush plating services. Chromex has ceased these plating and spraying operations, and is closing the room where these activities were conducted.

Chromex occupies a one room addition to the original building on the site. A facility layout diagram is included in Appendix A. The addition was constructed in 1973 by the former building owner, Fred Meyer Company. From 1973 to 1978 the room was occupied by Modern Plating, a subsidiary of the Fred Meyer Company. Modern Plating performed copper and brass plating within the room until 1978 when they ceased operation and vacated. Chromex occupied the room from 1978 until the present, and ceased plating operations on January 31, 1991. The title to the land and building is currently held by Lewerenz Company, Inc. of San Francisco, California.

PURPOSE OF CLOSURE

At this time, ExcelTrans has been contracted to develop and implement a full closure of the Chromex plating room. The goals of the closure are as follows:

- Decontaminate the room and process equipment where residues of hazardous materials may be present.
- Properly dispose of wastes generated during closure.
- Limit Charles Lowe Company's long-term liability associated with Chromex by closing the area in compliance with agency requirements.

Charles Lowe plans to move manufacturing operations currently performed at other areas of the site into the room following closure. After Chromex closes, the room will be divided between hydrostatic valve testing and sand blasting operations.

Charles Lowe is submitting this report to local regulators to establish closure protocols for the Chromex plating facility. The purpose of this report, therefore, is to present a viable approach to confirm that the cleaning performed has adequately removed residual contamination from chrome plating operations.

Subsequent chapters of the report will outline cleaning procedures for plating areas, establish sampling protocols for each task, discuss analytical requirements for each sample, and establish target clean levels to achieve in closure. A final closure report will be submitted after closure is completed to present analytical results and proof of disposal. Analyses will be based on hazardous materials handled or used in the room.

Sub-surface investigation is not included within the scope of this Work Plan. The need for soil sampling will be determined after the closure plan has been executed, and after the final inspection given by the Alameda County Health Agency.

FACILITY CLOSURE GUIDELINES

Federal closure requirements presented in 40 CFR 264 Subpart G specify closure performance standards applicable to RCRA facilities. These standards do not apply to Chromex in a strict sense, because Chromex is not a permitted hazardous waste management facility (TSDF). Applicable sections of 40 CFR Part 264 are useful, however, as a guideline for closure of manufacturing facilities which handle hazardous materials and generate hazardous waste. These guidelines include:

- 40 CFR 264.111: The owner or operator must close the facility in a manner that minimizes the need for further maintenance, and minimizes the potential for post-closure escape of hazardous wastes via runoff, leachate, etc.

- 40 CFR 264.178: Remove all hazardous waste and hazardous waste residues from containment areas.

- 40 CFR 264.197a: Upon closure of a tank system, the owner or operator must remove or decontaminate all waste residues. He must also remove or decontaminate structures and equipment contaminated with waste residues.

The Uniform Fire Code also provides some guidelines on vacating a building that used or stored hazardous materials.

- Section 11.411: Upon vacating or abandoning any premises, the occupant thereof shall remove any and all noxious and hazardous material or waste matter which has been deposited, allowed to come to rest or permitted to accumulate thereon, and such premises shall be left in a clean and neat condition. (1988 UFC)

OUTLINE OF CLOSURE PLAN

Section Two of this closure plan will outline specific steps to be taken in closing the plating area. This section of the plan will identify closure procedures for each task separately. Types and quantities of chemicals handled or stored in the room will also be addressed.

Section Three of this closure plan proposes analytical requirements to assess the achievement of target levels. Target levels for residual contamination after cleaning are presented.

Appendix A contains a layout diagram of the 1400 Park Avenue building, and includes a detail of the Chromex plating room.

Appendix B is the Site Safety Plan. Overall job safety requirements and emergency procedures are outlined, as well as site specific employee training program requirements. Personal protective equipment by job task, and job hazard analyses are also presented. Roles of key site and management personnel are defined in relation to safety.

SECTION II: WORK PLAN

PURPOSE

The purpose of this section of the closure plan is to present a step by step process by which the plating area can be closed, in a manner consistent with both County of Alameda requirements, and Charles Lowe management objectives.

Safety on the job is a top priority with ExcelTrans, and will not be sacrificed under any circumstances. Employees will be required to review the Site Safety Plan (SSP) in Appendix B, which will be available at the job site. Employees will also undergo site specific training as outlined in the SSP.

OUTLINE OF CLOSURE TASKS

For the purposes of closure, the work schedule has been separated into four distinct tasks as presented below.

1) Site preparation,

2) Pumping and removal of plating and etching tanks,

3) Removal of process and abatement equipment,

4) Decontamination of building structure.

Step-by-step closure procedures for each task are presented below. Also discussed is a list of chemicals stored in each area and a summary of the purpose of each item.

Task 1: Site Preparation

Before remediation operations commence, ExcelTrans will secure the work zone to prevent unauthorized entry. Bermed areas will be constructed to facilitate rinsate collection and prevent run-off to areas outside the work zone. Technicians will receive training in accordance with the Site Safety Plan included in Appendix B of this report.

Site preparation will proceed as follows:

A. Establish security area for on-site storage of remediation equipment.

B. Supply emergency and spill clean-up material to the site as specified in the Site Safety Plan.

C. Lock all internal access doors between the work area and the Charles Lowe manufacturing area. Limit access to the work zone with portable fencing, caution tape, or similar barricades.

D. Establish personnel and equipment decontamination station at the entrance to the work zone as specified in the Site Safety Plan.

E. Install a temporary berm around the perimeter of the plating room to facilitate rinsate collection.

F. ExcelTrans Safety Officer will provide site-specific training to technicians as detailed in the Site Safety Plan.

Task 2: Pumping and Removal of Plating and Etching Tanks

Chromex used a 12' deep, below grade vault to secondarily contain process tanks. The vault area contains 8 tanks that held plating, etching, and stripping solutions. The vault walls are constructed of 12" thick steel-reinforced concrete. Materials stored in the vault include four tanks of 26% chromic acid (3600; 3200; 3200; and 2800 gallons); two tanks of 20% hydrochloric acid (120; 60 gallons); one tank of 20% sulfuric acid (100 gallons); and one tank of 20% sodium hydroxide (750 gallons).

In addition to these tanks, the fume scrubber contains 50 gallons of scrubbing solution. Also, one empty 3200 gallon emergency storage tank and one 7000 gallon rinse water storage tank are outside the building and will be handled as specified in this section.

The tanks and associated piping will be cleaned and remarketed, either to a used equipment or scrap metal dealer. If no suitable buyer is found, cleaned tanks will be taken for Class III disposal.

Tank closure will proceed as follows:

A. Visually inspect for significant cracks in floors and sump. (No significant cracks are expected.) If any cracks are discovered, note in the field log for further investigation, photograph, and include in the final closure report. Repair with cement grout for steam cleaning.

B. Pump out liquids remaining in tanks and related piping, segregating each material by chemical compatibility. Dispose of material as hazardous waste.

C. Confirm each tank is empty.

D. Remove piping and any peripheral equipment. Steam clean or manage as hazardous waste.

E. Steam clean interior and exterior of tanks and related piping. Flush until pH of rinsate is neutral.

F. Use field test methods for pH, oxidizer characteristic, and chrome levels in final rinse. If a positive result is observed, continue washing until results indicate that the tank has been cleaned below target levels. (Target levels are discussed in Section Three. Record result for inclusion in final closure report.

Task 3. Removal of Process and Abatement Equipment

Plating operations utilized six rectifiers ranging in size from 2,000 to 10,000 amps supplied by a 220/440 volt 3-phase electrical panel on the west side of the Chromex room.

Two totally enclosed electric boilers and one heat exchanger heated process plating solutions.

A 1,000 cfm venturi-type fume scrubber and polypropylene ball floating covers were used to suppress the airborne concentration of chromic acid.

A two ton overhead crane was used to situate and remove items from the plating baths.

Process equipment will be removed, cleaned, and either remarketed, recycled as scrap, or sent for proper disposal. The electrical panel and overhead crane will be decontaminated and left in place.

Closure of process and abatement equipment will proceed as follows:

A. Lock-out power supply to/from electrical panel by qualified electrician.

B. Empty process piping of free liquids.

C. Disassemble and remove process equipment scheduled for disposal.

D. Steam clean equipment and related piping/ducting. Flush until pH of rinsate is neutral.

E. Use field test methods for pH, oxidizer, and chrome levels in final rinse. If a positive result is observed, continue washing until results indicate that the equipment has been cleaned below target levels. Record result for inclusion in final closure report.

Task 4. Decontamination of Building Structure

The Chromex plating room is a steel frame structure with double wall wood siding. The floor and sump area are 12" thick steel-reinforced concrete. The structure will be decontaminated and left in place.

Closure of the plating room will proceed as follows:

A. After equipment and piping have been removed or cleaned, pressure wash walls and floor with 2000 psi pressure washer. A chemical additive such as EDTA or an oxidizing mineral acid may be added to the wash water at low concentrations. (The chemical additive would aid in solubilizing and removing residual chrome through chelate formation.)

B. Use field test methods for pH, oxidizer, and chrome level in final rinse. If a positive result is observed, continue washing until the result indicates that residual contamination is below target levels.

C. Gather a composite sample of the final rinsate, provide chain-of-custody documentation, and submit to an independent, certified lab for the analysis outlined in Section Three. Record result for inclusion in final closure report.

If pressure washing operations are unable to adequately decontaminate the structure, optional remediation techniques may be employed. A layer of concrete may be removed by scabbling or abrasive media blasting techniques, then pressure washed and sampled as specified above. If contamination still exists, subsequent layers may be removed with a jackhammer, and again rinsed and sampled. If areas of the floor must be removed, concrete will be taken to a concrete recycler for disposal.

In like manner, several remediation options exist if pressure washing techniques are not sufficient to reach target levels for the wood siding. Abrasive media blasting may be used in areas where contamination is found after steam cleaning. Alternatively, structures unable to reach target limits may be encapsulated using a physical barrier such as plaster, epoxy resins,

or paint.[1] This would establish an impermeable barrier to isolate contaminated structures. As a last resort, areas of the wood siding may be removed and disposed as hazardous waste.

MANAGEMENT OF WASTES GENERATED

Several types of waste will be generated in cleaning the plating area. These include plating solutions, rinse water, pipe and duct lines, tanks and removed equipment. Disposition of these wastes is specifically addressed below.

Disposition of Plating Solutions and Rinse Waters

Plating solutions and wash waters generated in cleaning operations will be transported on a Uniform Hazardous Waste Manifest to an approved treatment and recycling facility. The rinse water will be managed according to EPA guidelines. Manifest copies will be included in the final report to document proper disposal.

Recycling and waste minimization are preferred in hazardous waste management. These will minimize Charles Lowe's long-term liability.

Disposition of Duct Lines, Piping, and Debris

All ducting, piping, and debris which previously contained hazardous materials will be removed and pressure washed. These items were exposed almost exclusively to chromic acid, and as such can be managed in like manner.

The disposal of ducting, piping, and debris is limited to three options:

1) Dispose of, uncleaned, at a hazardous waste landfill (Class I disposal).

2) Decontaminate as needed and dispose of at a local (Class III) landfill.

3) Decontaminate and remarket to scrap dealer.

The extent of residual contamination in the equipment, time required to decontaminate, and amount of waste generated in cleaning will determine which disposal option is utilized. Any rinse water from cleaning of piping or ducting will be managed as hazardous waste along with

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[1]M.P. Esposito et al and R. Clark et al, Decontamination Techniques for Buildings, Structures and Equipment (New Jersey: Noyes Data Corporation, 1987), 42-43, 52-58.

other waste water generated at the site (see Disposition of Rinse Water, above). Manifest copies and non-hazardous disposal receipts will be included in the final report to document proper disposal.

Disposition of Tanks and Equipment

The ten tanks will be rinsed with a 2000 psi pressure washer to remove residual contamination. Tanks range in size from 100 to 3,600 gallons. Equipment scheduled for disposal includes the rectifiers, heat exchanger, boilers, pumps, and other items.

The disposal of tanks and equipment is limited to three options:

1) Dispose of, uncleaned, at a hazardous waste landfill (Class I disposal).

2) Decontaminate as needed and dispose of at a local (Class III) landfill.

3) Decontaminate and remarket to private interest or scrap metal dealer.

The extent of residual contamination, time required to decontaminate, and amount of waste generated in cleaning will determine which disposal option is utilized. Any rinse water from pressure washing operations will be managed as hazardous waste along with other waste water generated at the site (see Disposition of Rinse Water, above). Manifest copies and non-hazardous disposal receipts will be included in the final report to document proper disposal.

SECTION III: EVALUATION OF DECONTAMINATION EFFECTIVENESS

PURPOSE

After cleaning has been completed, the extent of residual contamination must be determined. This will assess the effectiveness of cleaning. A variety of tests will be used in this evaluation. They include laboratory analyses (to be performed by California certified laboratories) and field analysis. Field tests include testing of pH using litmus paper, testing for oxidizer characteristic using potassium iodide paper and testing for chromate ion using chromate test kits.

This section presents specific tests to be performed on rinsate and other samples. Target cleanup levels will also be discussed.

SAMPLES

As part of the closure process in manufacturing areas, cleaning will be performed on all structures and equipment where hazardous materials were used or stored. The last phase of this cleaning will use a high pressure washer to remove contaminants. Final rinsate samples will be gathered from the pressure washing of the building structure.

Composite samples of the wood siding and the concrete floor will also be analyzed to assess the effectiveness of cleaning operations. Areas with heavier visible contamination will be targeted as sample points for final analysis.

Samples will be tracked using Chain of Custody protocol, and analyses will be performed in laboratories certified by the California Department of Health Services. Analysis will be based on hazardous materials previously handled in the room. Since various metals were used in plating operations, the rinsate sample from the plating room will be analyzed for all relevant metals. This will ensure that any significant residue remaining after cleaning will be identified and scheduled for further cleaning.

TARGET LEVELS

The extent of residual contamination following decontamination must be determined so effectiveness of cleanup methods can be assessed. This is done by establishing target "clean" levels for relevant contaminants.

In evaluating effectiveness of cleaning, the designated target level must reflect applicable regulatory constraints. Designated target levels must also be achievable with the remediation technology being employed.

Once a target level is established, it should be used as a guideline. Target levels are not intended as absolute standards, but to evaluate cleaning activities.

EBMUD Sewer Discharge Limits as Target Levels

The levels proposed below are based on the East Bay Municipal Utility District's Ordinance Number 311, "Wastewater Control Ordinance", dated February 1, 1990. These values are provided in Table 5 - 1 below. Soluble Threshold Limit Concentration (STLC) and Total Threshhold Limit Concentration (TTLC) values from Title 22, California Code of Regulations, section 66699 (b) are provided for reference only. (STLC and TTLC values are used in performing a hazardous waste determination.)

TABLE 5 - 1: Target Levels For Rinsate Samples

Parameter	Limit For One Sample	STLC Limit	TTLC Limit
Barium	5 mg/l*	100 mg/l	10,000 mg/kg
Chrome	2 mg/l	5 mg/l	500 mg/kg
Copper	5 mg/l	25 mg/l	2,500 mg/kg
Nickel	5 mg/l	20 mg/l	2,000 mg/kg
Silver	1 mg/l	5 mg/l	100 mg/kg
Zinc	5 mg/l	250 mg/l	5,000 mg/kg
pH	> 5.5	2.0 - 12.0	

* = Not defined by EBMUD Ordinance 311, but set at 5% of STLC value.

As discussed above, rinsate samples will be analyzed for constituents of hazardous materials previously handled in the room in question. Final rinsate samples will be analyzed for the above metals by STLC methods (EPA 3010 or equivalent). Composite or individual samples of concrete and wood siding will be analyzed by TTLC methods (EPA 3050 or equivalent). Final pH measurements will be performed using field test methods.

Analytical and field test results will be included in the final report.

LIST OF APPENDICES

Appendix A: Facility Layout Diagram

Appendix B: Site Safety Plan

CHROMEX SITE SAFETY PLAN

CLOSURE OF PLATING FACILITY

April 1, 1991

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SITE SAFETY PLAN

CLOSURE OF CHROMEX PLATING FACILITY

1.0 INTRODUCTION

This Plan describes the Health and Safety requirements for ExcelTrans remedial activities that will be performed in connection with closure of the hard chrome plating room at the Chromex site. Chromex is a division of the Charles Lowe Company, and is located at 1400 Park Boulevard in Emeryville, California. This plan is written specifically for ExcelTrans employees and its subcontractors, and is not intended for the protection of non-ExcelTrans personnel.

In accordance with 29 CFR 1910.120.(b)(1)(v), ExcelTrans will provide a copy of this plan to all subcontractors operating in or around the closure area to alert them to the hazards present.

Each subcontractor is responsible for the health and safety of his own personnel, and shall hold ExcelTrans harmless from, and indemnify it against, all liability in the case of an injury. All subcontractors must have their designated safety officer sign the Safety Plan Compliance Agreement at the back of this plan, signifying receipt and understanding of this Site Safety Plan.

The applicability of each section of this Site Safety Plan may vary according to the specific closure operation occurring or unforseen complications at the site. Also, customer requirements may change some of the details of this plan, though safety should never be sacrificed when performing any of the tasks covered herein.

1.1 Key Personnel:

Project personnel who will have the overall responsibility for the safe operation of this project are listed on the following page.

TABLE 1.1: PROJECT PERSONNEL

Name	Title	Phone/Pager
Dan Sedgwick	Operations Manager	(707) 745-8907 (707) 645-6903
Pat Kelly	Senior Field Supervisor/ Site Safety Officer	(707) 745-8907 (707) 645-6995
Dave Nielsen	Project Engineer	(415) 262-1513 (415) 809-1584
Hakeem Al-Raheem	ExcelTrans Safety Officer	(707) 745-8907 (707) 554-7735

1.2 Responsibilities of Key Personnel:

Operations Manager: Will commit equipment and financial resources to emergency situations.

Field Supervisor: Will enforce use of required safety equipment and practices. Will act as on-site emergency coordinator, and fill out incident/accident reports. Will conduct a Tailgate Safety Meeting with all ExcelTrans employees on the site before starting work. Will halt actions of subcontractors performing unsafe acts.

Project Engineer: Will prepare the Site Safety Plan which establishes minimum site requirements for safety equipment per job task. Will brief the site and ExcelTrans safety officer regarding implementation of the Site Safety Plan.

ExcelTrans Safety Officer: Will train field personnel in specifics of Site Safety Plan before Work Plan operations commence. Will review incident report forms, if any, and propose new safety measures as needed.

2.0 HAZARD EVALUATION

This Site Safety Plan addresses specific on-site work activities relevant to intended closure operations. Workers at the site will be experienced in hazardous waste remediation projects. The field supervisor will have received 40 hour SARA training consistent with 29 CFR 1910.120, and been through the additional 8 hour SARA supervisor's training.

Site workers will be informed that the work may involve physical or chemical hazards as outlined in Sections 2.3 and 2.4 below.

Based on the information available, this plan covers anticipated activities and hazards, and makes provision for modification or amendment as hazard-related data are discovered during the course of work. This plan will be amended with a hazard assessment if previously unknown hazards are encountered. Amendments must be in writing, and signed by both the Project Engineer and the Site Safety Officer.

2.1 Hazard Evaluation In The Work Zone:

Inside of the work zone, specific personal protection will be required as a function of job task, as outlined in section 4.0. On-site air monitoring will consist of an initial site survey to establish the airborne concentration of hexavalent chrome. Draeger tube readings will be obtained from the vault area and next to the fume scrubber. Once this test shows that the area is safe for work ($Cr < 0.5$ mg/m^3), employees may begin remediation activities.

2.2 Hazard Evaluation Outside Of The Work Zone:

During the all phases of site work, the site safety officer may perform monitoring of the site with Draeger tubes if work zone readings for airborne chrome exceed 0.5 mg/m^3. Outside of the work zone, respiratory protection will be mandated by Table 2.1 below. If workers complain of persistent eye, throat, and/or lung irritation, respirators should be used regardless of the chrome concentration in air.

TABLE 2.1: RESPIRATORY PROTECTION OUTSIDE OF WORK ZONE

CHROME CONCENTRATION	MINIMUM RESPONSE
< 0.1 mg/m³ Hexavalent Chrome	Limited hazard, no special action. No respirator required.
0.1 - 0.5 mg/m³ Hexavalent Chrome	Monitor for chromic acid vapors at least every 60 minutes.
> 0.5 mg/m³ Hexavalent Chrome	Half-mask acid vapor/dust and mist respirators worn by all in affected area. Monitor area for chromic acid vapors at least every 30 minutes.

2.3 Chemical Hazards:

Closure operations covered under this Site Safety Plan include remediation of tanks that last contained chromic acid plating solution. This material may contain some metals (chrome, copper and nickel, primarily). Also, some dip tanks were present that contained other mineral acids (hydrochloric and sulfuric) and a caustic solution (sodium hydroxide).

Unprotected exposure to these chemical hazards by contact with skin, breathing, or ingestion can result in health effects. Table 2.2 on the following page discusses hazardous materials representative of the chemical hazards which may be present at the site.

Chemical hazards associated with cutting the tanks will be minimal, as the tank will be drained of product, and rinsed until a neutral pH is observed before cutting operations begin.

TABLE 2.2: CHEMICAL HAZARD ASSESSMENT

Hazardous material	Primary hazards
Chromic acid	Causes severe burns through dermal and oral exposure. Potential carcinogen.
Hydrochloric, sulfuric acid	Causes severe burns through dermal and oral exposure.
Sodium Hydroxide	Causes severe burns through dermal and oral exposure.
Metals: Trace Nickel, Copper, Chrome	Toxic if ingested. Potential carcinogen.

2.4 Physical Hazards

Table 2.3 below is an identification of the physical hazards that are anticipated on the job site.

TABLE 2.3: PHYSICAL HAZARD ASSESSMENT

Task	Hazard	Preventive measure
Moving heavy items	Strained back	Use drum dolly to move drums. Employ proper lifting techniques.
Debris	Trip/Fall	Be aware of trip hazards in traffic areas.
General labor	Heat Stress	Monitor workers for signs of heat stress on warm days. Replace lost fluids. See Section 3.2.
General labor	Noise	Use hearing protection as dictated by site safety officer. See Section 3.3.
Confined space entry	Asphyxiation	Not covered under this SSP. Must be added as an addendum before confined space entry may proceed.
Altitude labor	Falls	Use fall protection or safety harness when working three feet or more above ground level.
Torch Cutting	Brightness	Wear appropriate safety shades to reduce visual impact of cutting torch. See Section 4.3.
	Burns	Allow time for cut metal to cool before handling.
	Inhalation	Wear appropriate respiratory protection as outlined in Section 4.3.

3.0 HAZARD MITIGATION AND PERSONNEL PROTECTION

The following section presents procedures on how to mitigate the primary potential hazards encountered in the different tasks of the project.

3.1 Potential Fire Hazard:

Combustible material in the immediate area should be cleared before work begins, to minimize the possibility and impact of a fire. Smoking will not be allowed in the work area.

3.2 Potential Heat Stress Hazards:

When heat stress related conditions are likely, the Site Safety Officer (field supervisor) will monitor employees for symptoms of heat stress. Symptoms include, but are not limited to, clammy skin, confusion, dizziness, fainting, fatigue, heat rash, light-headedness, nausea, profuse sweating, and weak pulse. Serious symptoms include convulsions, hot skin, incoherent speech, unconsciousness, and a ceasing of sweating. (If serious conditions exist, remove exterior clothing, and wrap in a wet blanket. Call for medical assistance.)

The threat of heat stress can be reduced by alternating work and rest periods in high heat conditions, performing heavy work during cooler periods of the day (if feasible), and replacing lost fluids with an electrolyte drink or drinking water.

Employees may be required to wear tyvek protective clothing to prevent chemical exposure, increasing the possibility for heat stress. The field supervisor should be aware of heat stress symptoms, and look for them when the temperature exceeds approximately 75°F.

3.3 Potential Noise Hazards

Where noise exposure is possible, a Simpson model 886 sound level meter or similar will assess the extent of potential exposure. If significant noise sources are present, proper protective equipment (ear plugs or muffs) will be selected in compliance with 29 CFR 1910.95. Noise levels in excess of 80 dBA will require ear plugs or muffs.

3.4 Potential Inhalation Hazard

To limit the level of smoke and dust in the room from torch cutting operations, a blower vented outside the building may be employed. If not able to vent directly outside, collapsible ducting may be used to direct airflow.

4.0 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Based on evaluation of potential hazards, the following minimum levels of personal protection will be designated for the applicable work area or task.

4.1 Entrance to the Site:

All ExcelTrans personnel and site visitors must wear the following upon entrance to the work area:

- Hard hat.
- Safety glasses.
- Long sleeved clothing.

4.2 PPE During Equipment Removal:

The following minimum requirements apply to personnel involved in removing process machinery, containerizing solid waste, and other tasks that do not include the direct handling of liquids. When performing these tasks, workers will wear, at a minimum, the following:

- Hard hat.
- Sturdy work boots with steel toes.
- Safety glasses (or goggles if handling liquids).
- Half face respirator fitted with suitable cartridges. Suitable cartridges will be NIOSH or MSHA approved to filter acid vapors.
- Paper tyvek or equivalent.
- Chemical resistant gloves.
- NOTE: Full face respirator may be substituted for half mask respirator and safety glasses.

4.3 PPE For Torch Cutting

The following minimum requirements apply to personnel directly involved in cutting metal items with an acetylene torch. When performing these tasks, workers will wear, at a minimum, the following:

- Hard hat.
- Sturdy work boots with steel toes.
- Welding goggles not less than shade 6.
- Half face respirator fitted with suitable cartridges. Suitable cartridges will be NIOSH or MSHA approved to filter acid vapors, dusts, fumes, and mists.
- Paper tyvek or equivalent.
- Leather gloves.

4.4 PPE for Pressure Washing or Liquid Handling

The following minimum requirements apply to personnel involved in pressure washing, liquid collection, or liquid handling operations. When performing these tasks, workers will wear, at a minimum, the following:

- Hard hat.
- Chemical resistant rubber boots with steel toes.
- Goggles.
- Half face respirator fitted with suitable cartridges. Suitable cartridges will be NIOSH or MSHA approved to filter acid gases, dusts, fumes, and mists.
- Poly tyvek.
- Chemical resistant gloves.
- NOTE: Full face respirator may be substituted for half mask respirator and goggles.

5.0 WORK ZONE ACCESS

Only authorized personnel will be permitted to enter the work zone while work is in progress. Authorized personnel will include those who have duties which require their presence in the work zone and have received appropriate health and safety training. Work zone access will be restricted by portable fencing and locks on internal doors leading to the adjoining building.

6.0 GENERAL SAFE WORK PRACTICES

The field supervisor is responsible for ensuring all crews have the proper tools and safety equipment for that day's work. Smoking shall be allowed on breaks and lunch in designated areas only. All employees will wash before beginning breaks and lunch, and upon completion of the work day.

6.1 Tailgate Safety Meetings

To ensure worker safety, employees will attend a tailgate safety meeting before starting work. A copy of the Site Safety Plan will be available for reference on-site. Work will be supervised by the site safety officer at all times.

6.2 Decontamination Procedures:

6.2.1 Level C protection: Level C consists of chemical resistant splash suit (poly coated tyvek), boots, and gloves; full or half face respirator; safety glasses and hard hat. The recommended decontamination procedures for Level C PPE are:

- Outer garment cleanup. For visible contamination, scrub boots, gloves, and tyvek splash suit with decontamination solution to remove liquid contaminants. Rinse thoroughly with water.
- Remove boots and place on plastic sheeting reserved for boot storage.
- Remove gloves and tyvek. Place used items in disposal container.
- Remove mask. Wash mask daily with soap and water solution. Rinse with water and allow to dry in clean area.
- Shower after work.

6.2.2 Level D protection: Level D is essentially a work uniform or long sleeves, along with a hard hat, safety glasses, and work gloves. Decontamination consists of glove and coverall removal, and washing hands. Employees will be instructed to shower after work.

6.2.3 Heavy equipment: Heavy equipment may include the solid tire forklift, reach forklift, scissor lift or pressure washer. The recommended decontamination procedure is as follows:

- Remove gross contamination with hand tools such as a shovel or broom.
- Rinse any remaining contamination with a pressure washer or water hose.
- Collect rinse water and manage as hazardous waste until analysis proves otherwise.

6.3 Respirators

Each employee must be fit-tested by the project safety officer for the specific respirator the employee wears. Employees are responsible for fit-testing the respirator before each use, and for the care and maintenance of the respirator.

6.4 Safety Equipment List

Before work begins each day, the following safety equipment must be available on site:

- Personal protective equipment
- Safety harness / fall protection
- Type ABC fire extinguisher, classification 20 ABC or higher
- First aid kit
- Caution tape, portable fencing, or similar barricade
- Drinking water
- Telephone
- Water supply with hose

7.0 EMERGENCY PROCEDURES

In general, a client's Emergency Procedures / Contingency Plan will apply to work done by the field crew. If for some reason client personnel are not immediately available, then ExcelTrans will be responsible for taking appropriate actions in an emergency. The following are minimum requirements in an emergency.

7.1 Minimum Emergency Response Equipment at the Site:

To ensure prompt response to an emergency at the site, the following emergency equipment will be maintained at the site:

- At least one fire extinguisher, class 20 ABC or higher.
- First aid kit.
- Telephone (if client phone not available, then make certain that a cellular phone is on site).
- Shovels.
- Several bags of sorbent material.
- Empty drums or a roll-off box.

7.2 Emergency Procedures for a Fire:

i. Identify type and approximate quantity of material involved. Call 911 for fire department response.
ii. If the fire is not controllable with a fire extinguisher, initiate evacuation of non-emergency personnel.
iii. To the extent possible, isolate other potential ignition sources (combustible materials, pallets, etc).
iv. Keep roads and evacuation routes clear for emergency personnel and vehicles.
v. Collect all fire fighting liquids and other residues by controlling run-off, and manage as hazardous waste unless certified analysis proves otherwise.

7.3 Emergency Procedures for an Explosion:

i. If a potentially uncontrollable fire results from an explosion, notify supervisor and call 911 immediately. Initiate evacuation of non-emergency personnel.
ii. After an explosion, beware of hazardous vapors which may be present in the vicinity of the incident and downwind. Put on personal protective equipment as directed by site safety officer.
iii. Safely remove any victims from dangerous areas if possible. For any injury requiring emergency medical treatment/transport, call 911. Never attempt to transport a victim with a back or neck injury.
v. Contain all spills which result, following spill response procedures.

7.4 Emergency Procedures for a Spill:

i. Notify supervisor.
ii. If the spill may affect public health or the environment off-site, immediately call 911 for emergency notification.
iii. Put on proper personal protective equipment for spill mitigation as directed by supervisor.
iv. Dike area with sorbent or soil, and apply sorbent to spilled liquids.
v. Remove all residues and manage as hazardous waste.

7.5 Emergency Procedures for an Injury:

i. Assess the nature and severity of the injury. Decontaminate victim with water hose if needed.
ii. If the injury requires emergency medical treatment or transport, call 911 for an ambulance.
iii. If the injury is life threatening, have trained personnel begin CPR if needed and administer first aid.
iv. For cuts and minor injuries, administer first aid.
v. If the victim is burned, apply water to the affected areas. Call 911 for emergency medical assistance.
vi. Fill out an incident/accident report.

7.6 Evacuation Procedure:

i. Never evacuate downwind of an incident.
ii. Do not run. Walk to an upwind location and await further instructions.

7.7 Emergency Phone Numbers:

Fire, Police, or Ambulance Emergency	911
Poison Control Center	(415)-476-6600
State Office of Emergency Services	(800)-852-7550
Chemical Emergency (Chemtrec)	(800)-424-9300
Regional Water Quality Control Board	(415)-464-1287
Bay Area Air Quality Management District	(415)-771-6000

7.8 Shutdown of Operations:

In the event that the contingency plan is implemented, work at the site will not proceed until all emergency response equipment has been recharged or replaced.

8.0 RECORD KEEPING REQUIREMENTS

The following record keeping will be maintained in the job file at the ExcelTrans office.

- Tailgate Safety Meetings.
- SARA Training records.
- Any incident / accident reports.
- Respirator training and fit test documentation.
- Site Safety Plan.
- Confined Space Training documentation.
- CPR / First Aid Training documentation.

Tailgate Safety Meeting

Date: _____

Business Name: Chromex
Location: 1400 Park Avenue
Emeryville, CA 94608

Instructor/Supervisor signature: _____

Job task: _____

Chemical hazards: _____

_____

Physical hazards: _____

_____

Protective clothing: _____

_____

Hospital address: Alta Bates
3001 Colby, Berkeley
(415) 540-0337

Emergency phone no.: **911**

Attendee	Signature
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Safety Plan Compliance Agreement

Client Name: Chromex
A division of the Charles Lowe Company

Site Address: 1400 Park Avenue
Emeryville, CA 94608

Subcontractor: _____

Mailing Address: _____

_____

Safety Officer: _____

I, _____, have received a copy of the Site Safety Plan for this project. I have reviewed the plan, understand it, and agree to comply with all of its provisions. I understand that the firm I represent could be prohibited from working on the project for violating any of the safety requirements specified in the plan.

Signed: _____

Date: _____

2

15

10

5

Revised 11-16-70 Added telephone data BFM

Revised 11-3-70 Added water utility data BFM

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ENGINEERING COMPANY

LEROY MARTIN P. E. CONSULTING CIVIL ENGINEER

975 "B" STREET HAYWARD, CALIFORNIA 581 - 1070

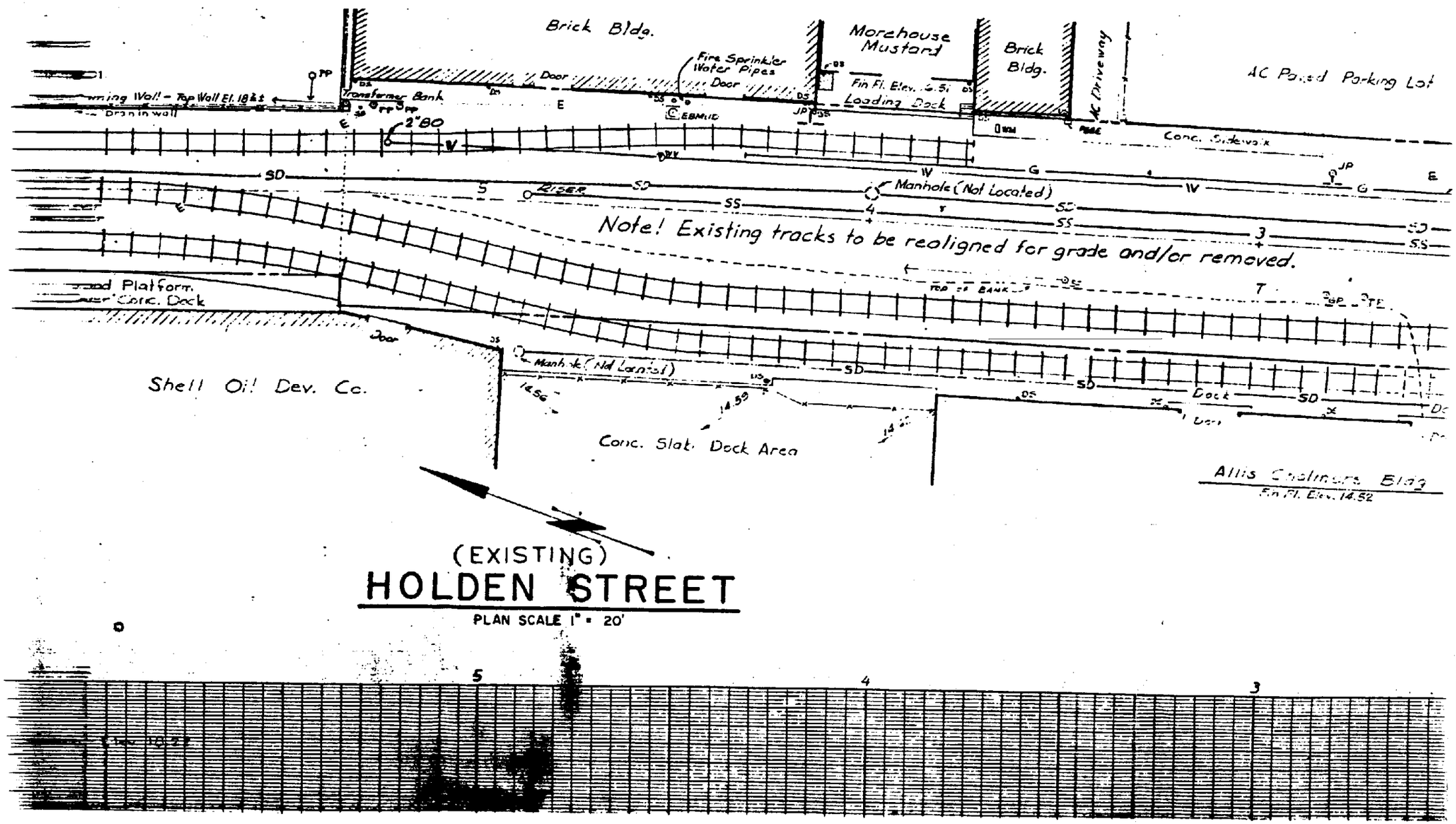
SCALE: As Noted	APPROVED BY:	DRAWN BY BFM
DATE: 14 OCT. 1970		REVISED

STREET IMPROVEMENT - HOLDEN STREET 45th STREET - PARK AVENUE, EMERYVILLE

TOWN OF EMERYVILLE

PARK AND HOLLIS, EMERYVILLE, CALIF.

DRAWING NUMBER 2397A-1


Brick Bldg.
Morehouse Mustard
Brick Bldg.
AC Driveway
AC Paved Parking Lot
Fire Sprinkler Water Pipes
Door
Transformer Bank
Loading Dock
Fin Fl. Elev. 15.51
Conc. Sidewalk
Manhole (Not Located)
Riser
Note! Existing tracks to be realigned for grade and/or removed.
Shell Oil Dev. Co.
Conc. Slab Dock Area
Allis Chalmers Bldg
Fin Fl. Elev. 14.52
(EXISTING)
HOLDEN STREET
PLAN SCALE 1" = 20'