APPENDIX A

LIST OF CONTACTS

Name[78]	Title	Organization	Telephone
Ms. Gail Arnold	Sr. Environmental Analyst	City of Seattle	206-684-7613
Mr. Tony Barrett	Stormwater Manager	Washington DOE	360-407-6467
Mr. Tom Bentsen		New York City DEP	212-860-9359
Mr. Fred Bromfeld	Sr. Environmental Engineer	DEQ Solid Waste Program	503-229-6210
Mr. Bob Campbell	Operations Planning Specialist	Snohomish County	425-388-3113
Mr. Ted Clausen	Maintenance Supervisor	Unified Sewerage Agency (USA)	503-681-7093
Mr. Jay Collins	Environmental Specialist	DEQ HW Technical Assistance Program	503-229-5165
Mr. Bert Folger	Supervisor	Scotts/Hyponex Composting	503-557-1028
Mr. Larry Geffner	Street Supervisor	City of Marysville	360-651-5100
Mr. Roy Harris	Maintenance and Operations Supervisor	City of Everett	425-257-8893
Mr. Kelly Hendryx	Stormwater and Sanitary Sewer Coord.	City of Portland, Bureau of Environmental Services	503-823-7585
Ms. Karla Keller	Maintenance Manager	ODOT Region 1	503-653-3086
Mr. Dick Lee	Stormwater & Sewer Section Supervisor	City of Olympia	360-753-8220
Mr. James Lenhart	VP Engineering	Stormwater Management Inc.	503-240-3393
Mr. Stuart Lindor		Delta Pollution Control	425-222-4544
Mr. Doug MacCourt	Environmental Manager	City of Portland, Transportation Dept.	503-823-7052
Ms. Roxi Mahloch		UCI	206-781-7117
Mr. Jeff Moore	Environmental Program Coordinator	ODOT, Clean Water Section	503-731-8289
Mr. Don Newell	Systems Administrator	Multnomah County	503-248-3888
Ms. Lee Newman	Dept. of Biochemistry	University of Washington	206-543-5504
Ms. Jeanne Nyquist	Operations Manager	City of Portland, Bureau of Maintenance	503-823-1798
Ms. Cindy Orser	Phytotech	New Jersey	303-499-9215
Mr. Dale Pierce	Manager	Flo Trend Systems	713-699-0152
Mr. Doug Putschler	Road Maintenance Mgr	Lane County Public Works	541-682-6993
Mr. Gary Skinner	Engineer/Sales	Flo Trend Systems	800-762-9893
Ms. Betsy Smith	Phytokenetics	Utah	801-755-0891
Mr. Keith Stone	Maintenance Manager	City of Beaverton	503-526-2568
Mr. Bruce Visser	Emergency/Env. Mgr	Marion County, Operations	503-588-5108
Mr. Haig Valenzuela	Stormwater Supervisor	City of Gresham	503-669-2381

[78] Thanks go to Jim Lenhart of Stormwater Management Inc. for contributions to this list of contacts.

APPENDIX B

COPIES OF SELECTED GUIDANCE AND BMPS FROM OUTSIDE OREGON

B1. "Managing Street Waste Through Reuse," Doug Pierce, WsDOT
B2. Massachusetts DEP Policy
B3. Selection from DOE draft guidelines
B4. Snohomish County Health Department Policy
B5. Snohomish County Public Works Waste Acceptance Procedure

ABSTRACT OF "MANAGING STREET WASTES THROUGH REUSE" PRESENTATION

by

Doug Pierce, WSDOT
TRB Conference Presentation
January 1998

BACKGROUND

The Washington Department of Transportation (WSDOT) generates approximately 8300 m^3 of catchbasin sludge, 37,000 m^3 of street sweepings and 1,700,000 liters of decant water associated with catch basin cleaning. Historically, the sludges were decanted in the field and disposed in the closest maintenance pit site. While some readily recyclable spent road abrasives have been recycled, the majority have been swept to the side of the highway or collected and also disposed at pit sites.

Local Public Works Departments' street waste practices throughout the state are similar to WSDOT's. In Washington, the Department of Ecology promulgates solid waste regulations and local health departments are given enforcement authority. Within the past five years, local health departments' interest in street waste management has increased and generators of these materials were being asked to reveal their disposal sites and amounts of material generated. Consequences of this heightened regulatory activity were the formation of intergovernmental committees to study the character of street wastes, the cessation of catchbasin cleaning by some jurisdictions, and forced landfilling of the material by some local governments. WSDOT continued its disposal practices because maintenance needed to be accomplished and landfilling costs would be prohibitive; approximately $3 million statewide.

WSDOT joined the inter-governmental workgroups and began to quantify and characterize its street waste in 1993. At that time the regulators were characterizing the materials as certainly "problem" wastes and likely "hazardous" wastes. Two of the more prominent street waste workgroups, the King County Surface Water Management and Snohomish County Vactor Grit taskforces, retained consultants to quantify and characterize the extent of the problem.

1993 WSDOT FUNDING PACKAGE

In the Spring of 1993, WSDOT Maintenance submitted a funding package for development of joint use catch basin sludge (vactor grit) dewatering facilities. The package was funded for the 1993-1995 and subsequent biennia for $540,000. The moneys are to be used to offer local government for the construction of vactor grit dewatering facilities, operated by local government and used by WSDOT and other public and private entities. In return for the funding, WSDOT receives a credit for future use, usually lasting 10 to 15 years.

Costs for construction of the facilities are generally in the $150,000 to $200,000 range. WSDOT retains ownership of its dewatered sludge and chooses not to allow for the materials' disposal in landfills. Some local governments (e.g. King County Engineering) have chosen to fund their own facilities and allow other users to participate through an operational fee. WSDOT has fully or partially contributed funding to four facilities and by the fall of 1997 will have access to an additional eight, all operated by local government. Moneys from this funding package have also been used to develop a small

WSDOT owned and operated dewatering facility and for purchase of two screens to remove the litter and debris from dewatered vactor grit.

WSDOT will continue to contribute funding toward dewatering facilities to the extent that sufficient facilities are available to provide for efficient operation of the catch basin cleaning program. Generally this means the availability of dewatering stations within thirty minutes travel of the operation.

COMPOSTING STUDY

In 1995, staff of WSDOT's Environmental Service Branch conducted research on the compostability of vactor grit to determine if this process reduced the levels of petroleum hydrocarbon inherent to the material. A local private composting company agreed to allow this study in return for payment of costs directly attributable to their involvement, e.g. operational costs. The local health department allowed for the study through a temporary solid waste permit. However, they were skeptical of the viability of this treatment method because of the dilution factor. That is, dilution is not allowed to reduce the levels of contaminants and proving that contaminant reduction occurs outside of dilution is difficult.

Through this project and consequent abundance of analytical data, WSDOT staff determined that the accepted national testing method for petroleum hydrocarbons, EPA method 418.1, was reporting false positive results. This method does not differentiate between petroleum hydrocarbons and those found in vegetative matter. For example, using the prescribed method 418.1, it was discovered that the total hydrocarbons in virgin sawdust used in the compost operation were 2000 ppm. This compares with the 1600 ppm-2200 ppm total petroleum hydrocarbon (TPH) level measured in vactor grit using method 418.1. Aside from this major analytical problem, composting did not prove to statistically reduce the levels of petroleum hydrocarbon in WSDOT's vactor grit.

TEST METHOD EPA 418.1

Concurrent with WSDOT's composting study, Snohomish County had contracted for a thorough study of the chemical characteristics of its vactor grit and street sweepings. This study also determined that test method 418.1 resulted in TPH levels substantially higher than more refined analytical methods such as gas chromatography-mass spectroscopy (GCMS). Also, staff at private analytical laboratories and the EPA laboratory at Manchester, Washington were aware of problems with this test method and were developing a more accurate analytical method. Using GCMS and/or test method WTPH-D extended, levels of petroleum in vactor grit are in the range of 400 ppm-700 ppm rather than 1600 ppm-2200 ppm. With Washington's hazardous site cleanup level for heavy petroleum hydrocarbons at 200 ppm, the significance of street wastes as a problematic contaminant source are substantially diminished.

Additional findings of the Snohomish County study were:

- Metals, TPH and carcinogenic polyaromatic hydrocarbons were detected in street waste.
- No seasonal differences were found.
- No consistent differences were found between residential and commercial areas.
- Organic (plant) material contributed to a false positive result with each of the three TPH

Analysis Methods Used

- Method WTPH-D extended with a sulfuric acid cleanup, typically provided the lowest TPH result and was the best of the three evaluated methods for minimizing the false positive contribution to the TPH result.
- Method TPH 418.1 provided the highest TPH result of the three methods.

There is a significant contribution from tires to street waste.

REGULATORY CHANGE

As a result of the findings of WSDOT's compost research and those of Snohomish County in 1995, the state Ecology Department began to re-evaluate its regulatory position related to street wastes. The agency began development of guidance for "Management of Street Waste" in 1996, receiving input from WSDOT, local health departments and local government. Wanting to proceed with reuse of the material while the guidance was being developed, WSDOT requested a formal written position from Ecology in May, 1996. The Manager of Ecology's Water Quality Program provided written concurrence that the materials were suitable for reuse without treatment. Specifically the letter stated that the "following reuse and recycle options are suggested for consideration by local health departments as appropriate for street waste solids on a site/land use specific basis with the goal of limiting exposure: road subgrade or parking lot subgrade; artificial topsoil manufacture for use at industrial sites, roadway medians, and airport infield areas; and other options developed by the health district."

Consequently, the precedent was set that allowed for reuse and recycling of street waste. This position was a significant step forward, considering the wastes had been deemed problematic or hazardous three years previously.

In September of 1996, WSDOT hosted a one-day workshop for all local health departments in the state and local public works officials to present the most recent information on the characteristics of street wastes and to promote consistency in regulation by local health officials. WSDOT also presented its strategy for reuse of the materials without treatment. Generally, the information was well received and most importantly, local government became aware that options for reuse of the material existed.

The second design option consists of a pit into which the vactor grit is dumped and then removed using a clam or backhoe. Liquids flow through an oil/water separator and then to the sewer. Facility costs range from $80,000 to $450,000 with factors related to the degree of variabilitysuch as size (related to type and number of users), soil conditions, and availability of sewer.

WSDOT does not place demands on local government for the type of facility design. The only two conditions placed on the owner are facility location and the retention by WSDOT of its own dewatered material.

SUMMARY

Significant changes have occurred since 1993 in Washington State regarding street waste management. These materials are no longer considered a waste or a hazard to the environment if used in certain applications. WSDOT and local government generators of these materials no longer are faced with costly landfill disposal. Local government, using WSDOT funds, are constructing dewatering facilities, and the materials are used for soil enhancement, shoulder rebuilding, median crossover construction and high density fills not impacting the surface or ground water. Public benefits are derived through more rational management of street wastes. Landfill space is not depleted, and costs for reuse options are significantly less than costs for disposal.

WSDOT will continue to fund dewatering facilities and continue to reuse the materials. WSDOT is challenging inconsistent regulation by local health departments, and consensus building is being achieved. Accountability of WSDOT maintenance activities related to street waste is being achieved through this more enlightened waste management program.

ACKNOWLEDGMENT

James D. Krull of the Washington State Department of Transportation exhibited foresight and leadership in first determining that street waste did not present significant environmental liabilities. He provided the State's first recommendations for reuse and recycling of the material. Appreciation is extended to the Legislative Transportation Committee of the Washington State Legislature for their commitment of funds for the development of street waste dewatering facilities.

Ecology [Washington Department of] published its guidelines for "Management of Street Waste" in November 1996, which provided a simple framework for generators of street waste to determine waste management options. According to the guidance, generally the materials do not need to be tested in that sufficient data is already available for this characterization. Highlights of the guidance include:

- Discharge of street waste liquids to a municipal sanitary sewer is recommended.
- Chemical testing of street waste solids is suggested where the final reuse location is unregulated or is not controlled by the generator.
- Suggested reuse options include: road subgrade or other road fill, controlled density fill, and soil for use at industrial sites, roadway medians and airport infields.

WSDOT'S PILOT PROJECT

A roadside soil enhancement and planting project was developed for construction in the fall of 1996. The landscape architect for WSDOT's Olympic Region agreed to use 800 m^3 of dewatered and screened street waste (catchbasin sludge and spent road abrasives) in conjunction with 1500 m^3 of bark and 1500 m^3 of mulch. The street waste was available at a pit site approximately 11 kilometers from the planting site.

WSDOT environmental staff mined the street waste for five days using a front-end loader and removed the debris with a shaker screen. Approximately twenty-five percent of the excavated material was removed as debris, including sticks, rocks, and metal. No solid waste permits were obtained, although the local health department was advised of the project.

Soil samples were taken (15cm depth) in a dozen locations in the area to which the soil would be applied. One year after application additional samples will be taken at the same locations and depth to determine whether the contaminants have migrated. The screened street waste substituted for imported topsoil, which would have cost the same or more than the mined and screened street waste. Other soil enhancement projects in the future offer an attractive opportunity to reclaim this material.

FACILITY DESIGN

Vactor grit dewatering facilities are generally of two types: slab and pit. The slab design consists of a sloping asphalt concrete slab draining to a catch basin, which flows to an oil/water separator and thence to the sewer. West of the mountains (Washington State) the facilities require covering to prevent rainfall from entering the sewer. East of the mountains covering is not required. Ecology blocks or Jersey barriers separate the areas being used by the different entities and a separate drying area is provided for final dewatering and loading out of the material.

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON MA 02108 (617) 292-5500

WILLIAM F. WELD
Governor

ARGEO PAUL CELLUCCI
Lt. Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

REUSE AND DISPOSAL OF STREET SWEEPINGS

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF WASTE PREVENTION

FINAL POLICY # BWP-94-092

This Policy provides guidance on the Department of Environmental Protection's requirements, standards, and approvals for handling, reuse and disposal of street sweepings.

15 April 1997
Date

By
Carl F. Dierker,
Assistant Commissioner,
Bureau of Waste Prevention

POLICY # BWP-94-092
TABLE OF CONTENTS

1 POLICY STATEMENT AND SCOPE

This Policy explains the Department of Environmental Protection's requirements for managing street sweepings. Street sweepings are solid waste subject to the Massachusetts solid waste regulations. The options for managing street sweepings are as follows.

1. Use the street sweepings in accordance with the pre-approved uses described in Section 4 of this policy.

2. Use the street sweepings for a beneficial use after obtaining prior approval from the Department under the provisions of the solid waste regulations, 310 CMR 19.060, Beneficial Use of Solid Wastes.

3. Dispose of street sweepings at a permitted solid waste landfill.

The provisions and requirements for managing street sweepings under these options are the subject of this policy.

2 APPLICABILITY

This policy applies to the reuse or disposal of street sweepings that are generated in the ordinary and customary maintenance of roadways. The policy does not apply to catch basin cleanings or street sweepings mixed with catch basin cleanings or other wastes. The policy does not apply to the material generated as the result of the clean up of an oil or hazardous material spill.

Street sweepings are not exempt from the Hazardous Waste Regulations, 310 CMR 30.000, and must be handled as hazardous waste when they exhibit any of the characteristics of a hazardous waste. If there is no evidence of unusual contamination, the Department does not require street sweepings to be routinely tested, but, as is the case with any waste, the generator has the ultimate responsibility for determining whether the waste is a hazardous waste.

3 DEFINITIONS

Department or DEP means the Massachusetts Department of Environmental Protection.

Public Way means the strip of land over and under a publicly owned, paved road or highway and includes the publicly owned land adjacent to the road or highway.

Street Sweepings means materials consisting primarily of sand and soil generated during the routine cleaning of roadways but may also contain some leaves and other miscellaneous solid wastes collected during street sweeping. Street sweepings does not mean the material generated during the clean up of a spill or material from other structures associated with a roadway such as catch basins.

Urban center roads means local roads in central commercial and retail business districts and industrial and manufacturing areas.

4 PRE-APPROVED USES, RESTRICTIONS AND CONDITIONS

This policy allows street sweepings to be used in several applications. No approval from the Department is required when the restrictions and conditions identified in this policy are adhered to. However, sweepings shall not be used unless prior approval is obtained from the owner of the location where the sweepings are to be used.

4.1 Use at Landfills

Street sweepings may be used for daily cover at lined or unlined permitted solid waste landfills and need no prior DEP approval if the sweepings satisfy the requirements for daily cover material specified at 310 CMR 19.130(15).

4.2 Use as Fill in Public Ways

Street sweepings shall be used for fill in public ways without prior approval from the Department only when the following restrictions and conditions are observed:

The sweepings have not been collected from Urban Center Roads (see definition);

The sweepings are used under the road surface or as fill along the side of the road within the public way;

The sweepings are not used in residential areas;

The sweepings are kept above the level of the groundwater;

The sweepings are not used in designated "No Salt Areas";

The sweepings are not used within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;

The sweepings are not used within 500 feet of a ground or surface drinking water supply.

4.3 Use As an Additive to Restricted Use Compost

Street sweepings shall be used as an additive to compost without prior approval from the Department only when the following restrictions and conditions are observed:

The sweepings have not been collected from Urban Center Roads (see definition);

The compost is used only in public ways;

The compost is not used in residential areas;

The compost is kept above the level of the groundwater;

The compost is not used in designated "No Salt Areas";

The compost is not used within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;

The compost is not used within 500 feet of a ground or surface drinking water supply.

5 OTHER USES

Any use not pre-approved in the preceding section requires prior Department approval under the Beneficial Use provisions of the Solid Waste Management Facility Regulations at 310 CMR 19.060. A "Beneficial Use Determination" or BUD can be made only after the submission of an application characterizing the waste and describing the proposed beneficial use.

6 DISPOSAL

While the beneficial use of street sweepings is strongly encouraged, the Department does not prohibit the disposal of street sweepings. Street sweepings may be disposed in either lined or unlined permitted solid waste landfills without prior approval from the Department.

7 HANDLING

7.1 Collection of Street Sweepings

Although DEP does not regulate the collection of street sweepings, collection practices should be compatible with intended uses. For example, sweepings from Urban Center Roads are not approved for the uses allowed for sweepings from other areas. Keeping sweepings from Urban Center Roads separate from sweepings from other areas will make the full benefits of this policy available.

This policy does not cover sweepings known to be contaminated by spills, and such sweepings should be collected separately and kept segregated. Depending on the contamination and circumstances, the handling of contaminated sweepings may be governed by the Massachusetts Contingency Plan, 310 CMR 40, the Massachusetts Hazardous Waste Regulations, 310 CMR 30, the Massachusetts Site Assignment Regulations for Solid Waste Facilities, 310 CMR 16 or the Massachusetts Solid Waste Management Facility Regulations, 310 CMR 19.

7.2 Storage

Street sweepings shall be temporarily stored prior to use, only when the following conditions are satisfied:

Storage must be at the site where the sweepings are generated (in the public way) or at a location, such as a DPW yard, that is under the control of the governmental entity which is doing the sweeping or has contracted for the sweeping;

The sweepings shall be protected from wind and rain to the extent necessary to prevent dust, erosion and off-site migration;

The sweepings shall not be stored within the 100 foot buffer zone of a wetland or within wetland resource areas including bordering vegetative wetlands and riverfront areas;

The sweepings shall not be stored within 500 feet of a ground or surface drinking water supply;

Storage shall incorporate good management practice and result in no public nuisance;

Storage must be temporary. Street sweepings shall be used within one year of collection unless the DEP Regional Office in the region where the sweepings are stored grants a written extension. An extension may be granted when it is demonstrated that all storage conditions will continue to be satisfied and the stored sweepings will be put to a specific identified use prior to the expiration of the extension period.

7.3 Preparation Prior to Use

Solid waste, such as paper, auto parts and other trash, shall be removed from the sweepings prior to use. Leaves, twigs and other organic matter should also be removed when good engineering practice indicates this is necessary to produce a material that is suitable for the intended use.

8 BACKGROUND

The Department has consistently classified street sweepings as solid waste subject to Massachusetts General Law Chapter 111, Section 150A and the Massachusetts Solid Waste Regulations (Site Assignment Regulations for Solid Waste Facilities, 310 CMR 16.00 and Solid Waste Management Facility Regulations, 310 CMR 19.000). There has been confusion among some in the regulated community about this classification.

Prior to the development of this policy, the options for handling street sweepings were limited to:

1. Disposal at a permitted solid waste landfill,

2. Use as cover at a permitted solid waste landfill or

3. Use in accordance with a Beneficial Use Determination (BUD). BUD decisions are made on a case-by-case basis and require the submittal of a formal application to the Department containing data showing the chemical composition of the street sweepings.

The simplest of these options was either to use the sweepings for landfill cover or to dispose of the sweepings at the local landfill. As many local landfills close, these options become less available to many communities. However, transporting sweepings to a distant landfill involves increased transportation costs and possibly payment of tipping fees.

To clarify the requirements and to provide simpler and less expensive alternatives for handling street sweepings, the Department undertook the development of this policy. Because useful studies of the chemical composition of street sweepings could not be found in the literature, the Department solicited the help of municipalities and state agencies in conducting a study of the composition of street sweepings from various types of areas. The results showed that sweepings from all areas, except Urban Center Roads, were similar with the main constituents of concern being total petroleum hydrocarbons (TPH) and polynuclear aromatic hydrocarbons (PAHs). Very limited data from Urban Center Roads indicated that sweepings from these areas may be more contaminated than sweepings from other areas.

The test results indicate that sweepings may contain levels of contamination that are unsuitable for unrestricted use. However, except for sweepings from Urban Center Roads, the levels of contamination were consistent and low enough to allow the use of sweepings in restricted applications without requiring testing or pre-approval as long as certain conditions were met. Sweepings from urban areas were excluded from some pre-approved uses. This situation could change when more data are available from Urban Center Roads.

This policy makes it possible for municipalities, state agencies and other governmental entities to handle street sweepings in an environmentally sound manner with a minimum of paperwork and expense.

9 ADDITIONAL INFORMATION

For additional copies of this policy, permit application forms or other DEP documents (except regulations) call any DEP Regional Office and ask for the Service Center or call the DEP Infoline in Boston. The permit application number for a Beneficial Use Determination is BWP SW-13 (Major) and BWP SW-30 (Minor).

Many DEP documents, including this policy, are available via modem from the DEP electronic bulletin board system, (617)292-5546. Information about the DEP and some documents are also available from the DEP's internet site at http://www.magnet.state.ma.us/dep.

Copies of all Massachusetts regulations, including the solid waste regulations, may be purchased from the State House Bookstore, (617)727-2834. The solid waste regulations are:

310 CMR 16.000, Site Assignment Regulations for Solid Waste Facilities

310 CMR 19.000, Solid Waste Management Facility Regulations

Questions about the Provisions of the Policy

If you have technical questions about the policy, please call any DEP office and ask to speak with a staff member about the provisions of the policy.

DEP InfoLine: from area code 617 and outside MA: (617)338-2255
from area codes 413 and 508: (800)462-0444
e-mail: infoline@state.ma.us

DEP Western Regional Office
436 Dwight Street
Springfield, MA 01103
Main Number: (413)784-1100
Service Center: extension 214

DEP Central Regional Office
627 Main Street
Worcester, MA 01605
Main Number: (508)792-7650
Service Center: (508)792-7683

DEP Northeast Regional Office
10 Commerce Way
Woburn, MA 01801
Main Number: (617(932-7600
Service Center: (617)932-7677

DEP Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347
Main Number: (508)946-2700
Service Center: (508)946-2714

DEP Boston Office
Division of Solid Waste
One Winter Street
Boston, MA 02108
(617)292-5960

SELECTION FROM DOE DRAFT GUIDELINES

Solids

Street waste solids commonly classify as solid waste. Sampling to date has shown that street waste solids do not classify as dangerous waste using TCLP analysis and following statistical guidance in Test Methods for Evaluating Waste, Physical/Chemical Methods, Sampling Plan SW-846 (US Environmental Protection Agency, 1986).

Street waste solids normally contain too high of levels of contaminants to allow indiscriminate reuse or disposal. There is no simple regulatory mechanism available to classify street waste solids as "clean" for indiscriminate reuse or disposal. Local health districts have used MTCA Method A cleanup levels to approximate "clean", but street waste solids commonly exceed MTCA Method A cleanup levels for TPH and carcinogenic PAHs.

The use of street waste solids at a location will not necessarily require a cleanup under MTCA. Exceeding MTCA Method A cleanup levels for TPH and carcinogenic PAHs in street waste and products made from street waste does not make the site where street waste is reused a cleanup site. A site is reportable only if "a release poses a threat to human health or the environment" (Ecology, 1994a). The reuse options proposed below are designed to meet the condition of not posing a threat to human health or the environment.

Chemical testing of street waste solids is recommended where street waste from a type of street waste facility or an area has never been characterized by testing. Testing in these instances would be to prove that the waste from their area does not designate as dangerous waste and to characterize the waste for reuse. TCLP metals, PAHs, and TPH analysis are recommended for these cases. The number of samples needed to be tested will depend on the testing results. Test Methods for Evaluating Waste, Physical/Chemical Methods, Sampling Plan SW-846 (US Environmental Protection Agency, 1986) should be followed to statistically determine the number of samples needed.

Chemical testing of street waste solids is suggested where the final reuse location is unregulated or is not controlled by the generator. Testing in these instances is for protection of waste generator in case the end user finds contamination on their site and claims the street waste is its source. Total metals, PAHs, and TPH analysis are recommended for these cases.

Chemical testing of street waste solids is required if: 1) the end user has their own testing requirements; or 2) dangerous waste is expected.

The following four classes of street waste solids and associated reuse disposal options are recommended:

1. **Uncontaminated Street Waste Solids** are materials collected as street waste that either is composed of vegetation, or recently deposited material that has not had the pollutant loading from traffic, or street waste solids that have shown through testing to not be dangerous waste and to not exceed MTCA Method A cleanup levels. The use of this waste depends on the requirements of the end recipient and local regulations although any of it may be handled as solid waste street waste. Examples of

solids normally classed as uncontaminated include:

a) Grass cuttings from grassy swales should be composted.

b) Recently fallen leaves and branches should be composted.

c) Coarse sand screened from street sweeping after road sanding if it passes a visual inspection and it contains greater than 50 percent coarse (1-4mm) sand, which is indicative of low traffic impact, may be reused for road sanding. Trash and fine material remaining is solid waste.

2. **Construction Street Waste** is street waste solids collected from sweeping or in storm water treatment systems at active construction sites. This waste may be placed back onto the site that generated it or any of the uses listed below.

3. **Solid Waste Street Waste** is the vast majority of street waste. The following reuse/disposal options are recommended for solid waste street waste:

a) Road subgrade, parking lot subgrade, or other road fill if treated to remove volatile constituents.

b) Controlled density fill when the site will be covered with paving or buildings if treated to remove volatile constituents and no drywells are allowed in the area of the fill.

c) Portland cement manufacturing.

d) Pre-fab concrete manufacturing.

e) Disposal, daily cover, or fill in a permitted solid waste landfill if dry (up to 200 pounds may be disposed of with regular solid waste).

f) Asphalt manufacture.

g) Treatment at a permitted contaminated soil facility.

h) Soil or top dressing manufacture for use at industrial sites, roadway medians and airport infields. (Not applicable for oily waste.)

i) Other low human or environmental contact uses approved by the jurisdictional health department as dangerous waste

4. **Dangerous Waste** includes street waste known and suspected to be dangerous waste. This waste must be handled following the Dangerous Waste Regulations (Chapter 173-303 WAC) unless testing determines it is not dangerous waste.

SNOHOMISH
HEALTH
DISTRICT
3020 Rucker
Everett, WA 98201

POLICY STATEMENT REGARDING
Street Waste Solids
Recycling and Disposal
Environmental Health Division
Solid Waste and Toxics Section
(206) 339-5250

BACKGROUND

Solids collected during the cleaning of storm sewers, streets and drainage ditches (collectively referred to as "street waste solids") have often been used in the past by generators as general purpose fill material. However, street waste solids fall within the state definition of solid waste established under RCW 70.95.030, and typically fail Model Toxics Control Act standards for total petroleum hydrocarbon (WTPH 418.1 Modified) levels. As such, many generators are now disposing of this material in landfills at considerable (and many believe unjustifiable) expense.

The State's Solid Waste Management Act, Chapter 70.95 RCW, promotes waste recycling (rather than landfill disposal) among its highest waste management priorities. The Snohomish Health District (Health District), in accordance with the Department of Ecology's (Ecology) waste reduction and recycling objectives, is therefore promoting recycling options for street waste solids which protect both public health and the environment.

POLICY STATEMENT

It is not the intent of this policy to establish a Health District program for formally regulating this type of material through a permit or routine inspection program. However, this interim policy will serve to guide Health District staff in assessing and directing street waste solids disposal and/or recycling situations, on a complaint basis or when a request for assistance is received from a generator. This policy will remain in effect until a statewide guidance policy is promulgated by the Department of Ecology or until the policy is rescinded by the Health District.

It should be noted that this policy has not been formally adopted or endorsed by the Department of Ecology. However, this interim policy was developed in cooperation with Ecology personnel responsible for solid waste policy development, and the contamination levels and end-uses for street waste solids outlined in this document were originally drafted by Ecology staff. The Health District believes the criteria contained in this interim policy meet with the Department of Ecology's approval.

It should also be noted that the Health District recognizes concerns expressed by many street waste solids generators regarding possible interferences (i.e. "false positives" resulting from the presence of vegetative matter) when using test method WTPH 418.1 Modified. The Health District supports the generators efforts, through the work of the Snohomish County Vactor Grit Task Force, to resolve this issue to the satisfaction of both the generators and the Department of Ecology. Resolution of this question, and reliance upon a different test method for characterizing street waste solids, may allow additional recycling opportunities for this material that are not currently outlined in this policy.

WASTE CHARACTERIZATION

Test data indicate that most street waste solids are typically not dangerous (hazardous) waste as defined by the State Dangerous Waste Regulations, Chapter 173-303 WAC. Therefore, routine testing of street waste solids for dangerous waste criteria is **not** typically necessary. However, if the waste collector finds upon visual inspection that the waste exhibits unusual characteristics that would indicate excessive pollution, that waste should be handled by following accepted spill response protocol, or appropriate precautions should be taken to segregate the contaminated materials until they can be properly characterized and disposed of as a dangerous waste. Indications that a street waste solid may be a dangerous waste include an obvious odor of gasoline or other volatile solvents; obvious pooling or accumulation of petroleum products upon visual inspection; suspicion of the presence of extremely acidic or alkaline materials; signs of chemical reaction, etc.

Testing of street waste solids for other constituents not necessarily specified in the State Dangerous Waste Regulations is necessary in order to determine contamination levels and identify appropriate end-uses as outlined in this policy. Sampling plans can be developed following guidelines for collecting samples from piles of contaminated soils, as outlined in the Department of Ecology's, Guidance for Remediation of Petroleum Contaminated Soils, 91-30, or sampling plans can be individually developed with assistance from the Health District. Unless there is reason to suspect that other contaminants may be present, samples should be analyzed for TPH (using WTPH 418.1 Modified), plus the following metals: arsenic, cadmium, chromium, lead, and inorganic mercury (using "total metals" analysis). If test results consistently show the same outcome, the Health District will consider a reduction in the frequency, constituents or number of samples analyzed, as proposed by the generator.

STORAGE

Piles of contaminated street waste solids must be placed on a liner, such as asphalt, concrete, or other impervious material, to collect and control any liquids associated with the pile. Surface water run-on and run-off from the piles must be controlled and managed as required by State Water Quality Regulations to prevent surface and groundwater quality degradation. Generally this will be accomplished by covering the piles with plastic tarps during rainy periods, to prevent water infiltration and the possible production of contaminated run-off from the piles. Piles established on an impervious surface which drains to a sanitary sewer (i.e. sewage treatment plant) need not be covered. Appropriate steps must also be taken to contain and dispose of litter or other garbage associated with the street waste solids.

It is recommended that street sweepings and vactor solids be stored in separate piles, due to the potential for differing levels of contamination. If vactor solids are being stored in conjunction with an operating vactor decant station, the dewatered solids should be stored as described above to prevent surface or groundwater quality degradation.

EXCLUSION

Street waste solids may be excluded from regulation as solid waste by the Snohomish Health District if it can be shown that:

1) The collected or processed solids consist only of soils, sands, gravels or sediments, and garbage, refuse, vegetative debris and other solids contaminants have been removed; and

2) Free liquids have been removed and appropriately treated and/or disposed of; and

3) Concentrations of chemical contaminants do not exceed cleanup values identified in Table 2, Method A Cleanup Levels - Soil, of the Model Toxics Control Act Cleanup Regulation (MTCA), WAC 173-340-740. (See Table 2 of this policy for partial list of contaminants.)

Street waste solids must be handled as solid waste until it is determined that this exclusion applies. Such solids that have been excluded from solid waste regulation by the Snohomish Health District may be used in any manner that would not cause a threat to human health or the environment. In keeping with established Ecology guidelines, the Health District recommends that these solids not be used in or adjacent to wetlands, surface water, groundwater, drinking water wells, or plastic pipes carrying drinking water. The Health District also recommends that they not be used near food crop growing areas, as residential topsoil or for other residential uses.

In addition, the Health District recognizes that street sweepings collected at certain times of the year may be nearly or entirely vegetative matter (e.g. fallen leaves, needles and branches), as opposed to potentially contaminated soil, rock and grit. Likewise, some jurisdictions may have the equipment to separate out vegetative matter from mineral constituents. In instances when segregated or collected street waste solids contain little soil (i.e. less than 10% by volume), these wastes may be managed as yard debris and would not be subject to the sampling and testing requirements of this interim policy. The material managed as yard debris must be taken to a permitted or approved composting facility, composted by the municipality according to a plan of operation acceptable to the Health District, or otherwise properly managed as yard waste.

Furthermore, it is the Health District's understanding that roadside ditch cleanings are unlikely to be contaminated unless such material is associated with a stormwater retention/detention system, a "biofilter" system or has been contaminated by a spill or other release. As such, ditching material not associated with one of these systems and presumed to be uncontaminated is excluded from this policy. Typically, clean ditching material can be segregated into vegetative and soil fractions, and recycled as yard waste (the sod fraction) and "clean" soil. Ditching material that may be contaminated must be stored, tested and handled in the same manner as other street waste solids covered under this policy. It is the generator's responsibility to visually inspect and otherwise determine whether the ditching material may be contaminated.

RECYCLING

The State's solid waste statute, Chapter 70.95 RCW, prioritizes the need to recycle rather than dispose of waste. When considering recycling options for street waste solids, contaminant levels must be considered to insure that the final end-use does not compromise the health of the public or the environment. Until such waste is recycled, it continues to be regulated as solid waste. The following are options for street waste solids recycling:

CLASS "A" STREET WASTE SOLIDS

Class "A" street waste solids are those solids whose contaminants do not exceed levels established in Table 1 of this interim policy, and (for contaminants not identified in Table 1) whose levels do not exceed cleanup levels identified in Table 2, Method A Cleanup Levels - Soil, of the Model Toxics Control Act Cleanup Regulation, WAC 173-340-740. Street waste solids must be tested to determine a baseline for levels of regulated contaminants. (Refer to the Waste Characterization section of this policy for information concerning testing.)

POTENTIAL END USES - CLASS "A" STREET WASTE SOLIDS:

- Road subgrade, parking lot subgrade, or other road construction fill. Must be used under or incorporated into asphalt or concrete paving, and the road must have a design which meets standards and specifications of the local jurisdictional authority (1).
- Reuse as street traction sand (1).
- Pipe bedding - excluding bedding around plastic (e.g. PVC, polyethylene) pipe used to convey drinking water (1) (2).
- Utility trench backfill - excluding backfill around plastic (e.g. PVC, polyethylene) pipe used to convey drinking water (1) (2).
- Controlled density fill - utilizing a design which meets standards and specifications of the local jurisdictional authority (1) (2).
- Fill in commercial or industrial zones (1) (2) (3).
- Any option approved for recycling of Class "B" street waste solids.
- Other end-use as approved by the Snohomish Health District.

Class "A" street waste solids cannot be reused for the end-uses listed above if they would be placed in an area which is likely to result in the contamination of ground or surface water, or lead to other potential environmental or public health problems (for example, a roadside ditch likely to convey water).

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1) Would first require removal of litter and vegetative matter.

2) The end-use should take into consideration potential human contact exposure both at the time of use and in the future.

3) This end-use requires the following actions be taken:

   (a) Completed fill must be "encapsulated" with two (2) feet or more of uncontaminated, relatively impervious soil.

(b) Completed fill site must be recorded on Deed with Snohomish County Auditor's Office, to include the following information:

- Tax I.D. Number(s) for fill area.
- General description of fill location on tax lot, attach map.
- Certification Statement regarding contaminant levels, for example:

  "I certify that the Class A street waste solids disposed here meet contaminant levels specified by Snohomish Health District's Interim Policy Concerning Street Waste Solids Recycling and Disposal. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the Class A Street Waste Solids contaminant levels have been met."

NOTE: **All recycling end-uses must be conducted in compliance with specifications required by federal, state or local regulations, or specifications required by a facility, manufacturer or vendor accepting the street waste solids for processing or recycling.**

Although use of Class "A" street waste solids in the manners outlined above is accepted as a prudent end-use by the Health District, certain end-uses may not be consistent with the Model Toxics Control Act Cleanup Regulation. Generators interested in pursuing these options are therefore advised to seek independent legal counsel before proceeding.

CLASS "B" STREET WASTE SOLIDS

Class "B" street waste solids are solids whose contaminant levels exceed Class "A" street waste solids contaminant levels, but do not designate as dangerous waste under Chapter 173-303 WAC.

POTENTIAL END-USES - CLASS "B" STREET WASTE SOLIDS:

- Pre-fab concrete manufacturing. **NOTE:** Facility manufacturing concrete must, in most instances, submit recycling permit application to the Health District for review and approval.
- Portland cement manufacturing. **NOTE:** Facility manufacturing cement must, in most instances, submit recycling permit application to the Health District for review and approval.
- Asphalt manufacturing. **NOTE:** Facility manufacturing asphalt must, in most instances, submit recycling permit application to the Health District for review and approval.

- Treatment at a contaminated soil treatment facility. **NOTE:** Facility treating contaminated soil must, in most instances, submit an application to the Health District for review and approval.

- Daily cover or fill in permitted municipal solid waste landfills, provided that the street waste solids have been dewatered. Class "B" street waste solids cannot be used for final cover during a landfill closure.

- Other end-use as approved by the Snohomish Health District.

INAPPROPRIATE END-USES - CLASS "A" and CLASS "B" SOLIDS:

- Department of Natural Resources surface mining reclamation (for example, gravel pit reclamations not specifically permitted as solid waste disposal sites).

- On-site sewage disposal sand filter and/or mound system construction.

- Cover or fill in an inert-demolition waste landfill.

DISPOSAL

Untreated street waste solids destined for final disposal may only be disposed in a permitted municipal solid waste landfill, provided that they have passed the visual inspection for dangerous waste identification, and have been dewatered.

Robert A. Pekich, Director
Environmental Health Division

Effective Date: January 1, 1995

TABLE 1

MAXIMUM END-USE CONTAMINANT LEVELS FOR VACTOR AND STREET SWEEPING SOLIDS

ANALYTE	ANALYTICAL METHOD	MAXIMUM LEVEL (ppm)
Heavy Fuel Hydrocarbons (C24-C30)	WTPH 418.1* Modified	2000
Diesel (C12-C24)	WTPH-D	500
Gasoline (C6-C12)	WTPH-G	250
Benzene	8020	0.5
Ethylbenzene	8020	20
Toluene	8020	40
Xylenes (total)	8020	20

Contaminants not identified in Table 1 must meet levels established in MTCA Method A Cleanup Levels - Soil (Refer to Table 2 of this document).

To support the accuracy of test results, alternative testing protocols may be substituted upon approval by the Snohomish Health District.

* The Health District recognizes concerns expressed by many street waste solids generators regarding possible interferences (i.e. "false positives" resulting from the presence of vegetative matter) when using test method WTPH 418.1 Modified.

TABLE 2

MODEL TOXICS CONTROL ACT (CHAPTER 173-340 WAC)
METHOD A CLEANUP LEVELS - SOIL

ANALYTE	ANALYTICAL METHOD	MAXIMUM LEVEL (ppm)
Arsenic	Total Metals Analysis	20
Cadmium	Total Metals Analysis	2.0
Chromium	Total Metals Analysis	100
Lead	Total Metals Analysis	250
Mercury (Inorganic)	Total Metals Analysis	1.0
PAHs (Carcinogenic)	8270	1.0
PCB Mixtures	8080	1.0
TPH (Heavy Fuel Hydrocarbons)	WTPH 418.1 Modified	200
TPH (Diesel)	WTPH-D	200
TPH (Gasoline)	WTPH-G	100

NOTE: Refer to Table 2, Method A Cleanup Levels - Soil, of the Model Toxics Control Act Cleanup Regulation, Chapter 173-340-740, for complete listing of substances.

121394/dmb

SNOHOMISH COUNTY VACTOR DEWATERING SITE
WASTE ACCEPTANCE PROCEDURE

LOAD CHARACTERIZATION PROCEDURE

A. Customer Identification (*known)

These are loads received from *known governmental agencies and established customers. *Known means a documented history of bringing in consistently treatable loads. Such agencies or customers now includes, but is not necessarily limited in the future to: Snohomish County Roads, Snohomish County Solid Waste, Snohomish County Surface Water, Washington State Department of Transportation and Snohomish County Cities and Towns.

B. Customer identification (private sector)

These are loads received from all customers other than "*known customers."

1. All new customers will need to apply for credit customer status with Snohomish County Department of Finance including appropriate bonding to become a part of the automated weighing, ticketing and billing system prior to using the facility. There will be no cash or check customers permitted to dump at the facility as all transactions will be done on the facility computer with pre-approved accounts only.

2. Application forms to be submitted to the Snohomish County Department of Finance for Attachment of Funds (Attachment A), Solid Waste Cash Bond (Attachment B) and Solid Waste Division Dump Fee Bond (Attachment C).

3. All customers, other than "*Known Customers" as defined in Section A, will be permitted to dump their vactor grit wastes on a pre-scheduled appointment time only. The vactor facility will be open Monday through Friday from 8:00 am to 3:00 pm, except normal County designated holidays. Appointments must be arranged in advance by calling facility operations at (206) 668-7862.

C. Testing, Acceptance and Processing

Loads received from all customers, private sector loads and "*Known Customers" as defined in Section A, will be subject to the same operational handling procedures, as outlined below:

1. All loads will be subject to a visual and odor screening by the facility operator.

PHYSICAL OBSERVATIONS FOR FIELD TESTING OF VACTOR GRIT

a. Be alert as the water is dumped from a customer vactor load. Careful sight and odor observations will be made on each load. Any one of the below observations is cause for field testing of the load or rejection.

1. Sight Observations

   a. Look for a sheen, petroleum globules or an oil slick on the water.

   b. Water that is dark brown, reddish or brownish black may be suspect for oxidized metals.

2. Smell Observations

   a. Smell for an odor of gasoline, solvent, fuel oil or any strong petroleum smell.

   b. Smell for noxious chemical odors.

   c. Any smell of septage must be tested or rejected.

Caution! Do not subject yourself to any excessive exposure to odors or vapors from any chemical! Use your sense of smell carefully, as overexposure can cause harm to your body.

2. All loads will be subject to field testing on a random basis or if the operator suspects that the load may be contaminated because of screening or origin.

3. Most solids will be decanted and then handled as a reusable commodity or solid waste. The long term goal is to reuse the vactor solids in accordance with a policy approved by the Snohomish Health District.

4. Liquids, dumped before weighing solids, will not be field tested unless the operator observes obvious serious contamination. Most liquids will go directly to the waste water treatment facility.

5. If the operator's observation determines the vactor solid load is questionable, the operator will inform the driver to pull aside while field testing is performed on the water/solid load sample.

6. Three field tests on solids will be performed. Failure of any one of these tests is cause for the operator to reject the load.

   a. Conductivity (> 5,000 μ mho / cm) limit for load rejection. This test is an indicator for high metals content.

   b. pH (< 5 or > 10) limits for load rejection. This test is for strong acids and bases.

   c. TPH-D (limits yet to be determined, but probably > 10,000 ppm TPH). This test is for total petroleum hydrocarbons.

7. Loads that do not pass field testing for contamination will be rejected by this facility.

8. Rejected loads will not be allowed to dump any solids. The operator will carefully record in the log book all information pertaining to the rejected load including operator observations, origin of the vactor waste and field test results.

9. If the load is rejected, the operator will inform the driver of other options. These options include having the load tested by an analytical laboratory for proof that the load is not hazardous or taking the load to a private hazardous waste disposal center. The operator will inform the driver that the Snohomish Health District and other appropriate regulatory agencies will be immediately informed of the contaminated load.

10. Any previously rejected load that can pass minimum standards for vactor waste acceptance, after being tested by an approved analytical laboratory, will be accepted after submission of written proof.

11. All customers will receive a load transaction ticket and will pay the flat charge of $31.10/visit for dumping their liquid and for administrative costs, even if solids are not dumped.

12. In addition to the flat fee, a tip fee of $56.50/ton will be charged to customers delivering solids.

13. The Snohomish County Solid Waste Management Division and it's appointed vactor decant facility operator reserve the right to require any customers delivering vactor waste loads to the facility to do an appropriate laboratory waste characterization test on any vactor load. The purpose of this test is for waste characterization, as addressed in "Policy Statement Regarding Street Waste Solids Recycling and Disposal" (Snohomish Health District, 1-1-95) or in Washington State Dangerous Waste Regulations (WAC 173.303). The results of this test will be submitted, in writing, to the County's facility operator and also shared with the Snohomish Health District.

Snohomish County, Washington
Public Works Department
OPERATOR:kmoser

TYPE REPORT
WASTE INBOUND TRANSACTIONS TONNAGE
Solid Waste Management Division
Cathcart Landfill Site

FOR PERIOD 02/01/97 - 02/28/97
RUN DATE: 09/23/97
TIME: 11:37
PAGE: 1

GEOWARE - Waste Management Automation System

	TONS	FEES	PERCENT
27 VACTOR GRIT AT CATHCART	121.98	6,491.15	100.00
2 MATERIAL TYPE	0.00	0.00	0.00
3 MATERIAL TYPE	0.00	0.00	0.00
4 MATERIAL TYPE	0.00	0.00	0.00
5 MATERIAL TYPE	0.00	0.00	0.00
6 MATERIAL TYPE	0.00	0.00	0.00
7 MATERIAL TYPE	0.00	0.00	0.00
8 MATERIAL TYPE	0.00	0.00	0.00
9 MATERIAL TYPE	0.00	0.00	0.00
10 MATERIAL TYPE	0.00	0.00	0.00
11 MATERIAL TYPE	0.00	0.00	0.00
12 MATERIAL TYPE	0.00	0.00	0.00
13 MATERIAL TYPE	0.00	0.00	0.00
14 MATERIAL TYPE	0.00	0.00	0.00
15 MATERIAL TYPE	0.00	0.00	0.00
16 MATERIAL TYPE	0.00	0.00	0.00
17 MATERIAL TYPE	0.00	0.00	0.00
18 MATERIAL TYPE	0.00	0.00	0.00
19 MATERIAL TYPE	0.00	0.00	0.00
20 MATERIAL TYPE	0.00	0.00	0.00
GRAND TOTAL	121.98	6,491.15	100.00

Snohomish County, Washington
Public Works Department
OPERATOR:kmoser

TYPE REPORT
WASTE INBOUND TRANSACTIONS TONNAGE
Solid Waste Management Division
Cathcart Landfill Site

FOR PERIOD 08/01/97 - 08/31/97
RUN DATE: 09/23/97
TIME: 11:41
PAGE: 1

GEOWARE - Waste Management Automation System

	TONS	FEES	PERCENT
27 VACTOR GRIT AT CATHCART	302.22	17,292.06	100.00
2 MATERIAL TYPE	0.00	0.00	0.00
3 MATERIAL TYPE	0.00	0.00	0.00
4 MATERIAL TYPE	0.00	0.00	0.00
5 MATERIAL TYPE	0.00	0.00	0.00
6 MATERIAL TYPE	0.00	0.00	0.00
7 MATERIAL TYPE	0.00	0.00	0.00
8 MATERIAL TYPE	0.00	0.00	0.00
9 MATERIAL TYPE	0.00	0.00	0.00
10 MATERIAL TYPE	0.00	0.00	0.00
11 MATERIAL TYPE	0.00	0.00	0.00
12 MATERIAL TYPE	0.00	0.00	0.00
13 MATERIAL TYPE	0.00	0.00	0.00
14 MATERIAL TYPE	0.00	0.00	0.00
15 MATERIAL TYPE	0.00	0.00	0.00
16 MATERIAL TYPE	0.00	0.00	0.00
17 MATERIAL TYPE	0.00	0.00	0.00
18 MATERIAL TYPE	0.00	0.00	0.00
19 MATERIAL TYPE	0.00	0.00	0.00
20 MATERIAL TYPE	0.00	0.00	0.00
GRAND TOTAL	302.22	17,292.06	100.00

Snohomish County, Washington
Public Works Department
OPERATOR:kmoser

TYPE REPORT
WASTE INBOUND TRANSACTIONS LOADS
Solid Waste Management Division
Cathcart Landfill Site

FOR PERIOD 02/01/97 - 02/28/97
RUN DATE: 09/23/97
TIME: 11:37
PAGE: 1

GEOWARE - Waste Management Automation System

	LOADS	FEES	PERCENT
27 VACTOR GRIT AT CATHCART	34.00	6,491.15	100.00
2 MATERIAL TYPE	0.00	0.00	0.00
3 MATERIAL TYPE	0.00	0.00	0.00
4 MATERIAL TYPE	0.00	0.00	0.00
5 MATERIAL TYPE	0.00	0.00	0.00
6 MATERIAL TYPE	0.00	0.00	0.00
7 MATERIAL TYPE	0.00	0.00	0.00
8 MATERIAL TYPE	0.00	0.00	0.00
9 MATERIAL TYPE	0.00	0.00	0.00
10 MATERIAL TYPE	0.00	0.00	0.00
11 MATERIAL TYPE	0.00	0.00	0.00
12 MATERIAL TYPE	0.00	0.00	0.00
13 MATERIAL TYPE	0.00	0.00	0.00
14 MATERIAL TYPE	0.00	0.00	0.00
15 MATERIAL TYPE	0.00	0.00	0.00
16 MATERIAL TYPE	0.00	0.00	0.00
17 MATERIAL TYPE	0.00	0.00	0.00
18 MATERIAL TYPE	0.00	0.00	0.00
19 MATERIAL TYPE	0.00	0.00	0.00
20 MATERIAL TYPE	0.00	0.00	0.00
GRAND TOTAL	34.00	6,491.15	100.00

Snohomish County, Washington
Public Works Department
OPERATOR:kmoser

TYPE REPORT
WASTE INBOUND TRANSACTIONS LOADS
Solid Waste Management Division
Cathcart Landfill Site

FOR PERIOD 08/01/97 - 08/31/97
RUN DATE: 09/23/97
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PAGE: 1

GEOWARE - Waste Management Automation System

	LOADS	FEES	PERCENT
27 VACTOR GRIT AT CATHCART	129.00	17,292.06	100.00
2 MATERIAL TYPE	0.00	0.00	0.00
3 MATERIAL TYPE	0.00	0.00	0.00
4 MATERIAL TYPE	0.00	0.00	0.00
5 MATERIAL TYPE	0.00	0.00	0.00
6 MATERIAL TYPE	0.00	0.00	0.00
7 MATERIAL TYPE	0.00	0.00	0.00
8 MATERIAL TYPE	0.00	0.00	0.00
9 MATERIAL TYPE	0.00	0.00	0.00
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12 MATERIAL TYPE	0.00	0.00	0.00
13 MATERIAL TYPE	0.00	0.00	0.00
14 MATERIAL TYPE	0.00	0.00	0.00
15 MATERIAL TYPE	0.00	0.00	0.00
16 MATERIAL TYPE	0.00	0.00	0.00
17 MATERIAL TYPE	0.00	0.00	0.00
18 MATERIAL TYPE	0.00	0.00	0.00
19 MATERIAL TYPE	0.00	0.00	0.00
20 MATERIAL TYPE	0.00	0.00	0.00
GRAND TOTAL	129.00	17,292.06	100.00

APPENDIX C

ODOT REGION 1 ROADWASTE SCREENING REPORT

by Julee Reynolds

SOLID WASTE DISPOSAL **Revised 12/3/96**

To bring ODOT, Region 1, into environmental compliance with regard to solid waste disposal (street sweepings) would cost **$844,883.00** if all material were hauled to a permitted landfill facility.
Implementation of the proposed solutions #1 & #3 would result in a cost savings of **$800,00.00** +/- in Region 1 during the first year of implementation. Future savings would be higher or lower based on the amount of material generated.

Problem/Background

ODOT has recently been faced with recriminations and citations from the Department of Environmental Quality concerning the disposal and stockpiling of materials (street sweepings and vactor wastes) generated through operation and maintenance of ODOT facilities.

- ODOT is currently stockpiling and disposing of material that is legally defined as solid waste and is required by law to go to permitted landfills.
- Stockpiled material (sweepings, gravel, etc.) has been placed at inappropriate places (adjacent to streams, wetlands, etc.)
- ODOT can legally store only "clean" materials at designated storage sites. (Clean material is litter free and contains levels of oils, grease, metals, organics, etc. that are below RCRA thresholds.)

In order to achieve environmental compliance and avoid future citations, ODOT will need to correct the listed conditions. There is currently only one legal solution to correct the street sweepings disposal issue facing ODOT. Under DEQ rules, all street sweepings, as picked up off the road, are required to go to a permitted landfill. ODOT, Region 1, produced 7,750 cubic yards of street sweepings material in 1995. Currently disposal fees are $58.00 per ton. The cost for disposal of the solid waste generated from street sweeping during 1995, if taken to a landfill would be $844,883.00 (including hauling costs). Calculations below:

Sweeping Material Disposal Cost
1 cy. sweepings = 3,300 lbs. +/-
7,750 cy. X 3,300 lbs. = 25,575,000 lbs.
25,575,000 ÷ 2,000 = 12,787 tons
12,787 x $58.00 = **$741,675.00**

Sweeping Material Hauling Costs

District 2A - $ 17,072.00
District 2B - $ 18,158.40
District 2C - $ 67,977.60

$103,208.00

Concerns

Disposal of untreated street sweepings under DEQ guidelines is a state wide issue. Under current financial constraints, ODOT can not afford to dispose of its street sweepings as directed by DEQ.

Solutions

1. Generate less material . Implement "Quick Hit" Best Management Practices as out lined in "White Paper" on Sidecast Sweeping and Plowing, September 1996.

2. Street sweepings can be screened to remove "noticeable quantities" of litter and visually inspected during the screening process for noticeable quantities of oils/fuels. Once "noticeable quantities" of litter (misc. debris) is removed, street sweepings are then considered "clean fill" and do not have to be disposed of at a permitted landfill.

Oregon Administrative Rules (OAR) 340-93 define "clean fill" as exempt from regulation as solid waste.

DEFINITION: 340-93-030 "Clean Fill" means material consisting of soil, rock, concrete, brick, building block, tile, or asphalt paving, which do not contain contaminants which could adversely impact the waters of the State or public health.

Excerpted from a memo from DEQ to Jeff Moore, dated April 4, 1996; "Sweepings that contain noticeable quantities of litter are not clean", "Checking for litter and oils/fuels can be visual."

ODOT owns ten "shakers" that are currently used for sorting/sizing crushed rock. By screening with 3/4" mesh, street sweepings can successfully be screened to meet DEQ standards. A "shaker" can screen approximately 200 cubic yards of material per hour. The shaker takes 4 people 2 hours to set up and requires oversize load permits to move.

3. Purchase and use "Read Screen-All" to remove miscellaneous debris. The "Read Screen All" is a portable, self powered screening machine that can screen materials ranging from wet top soil to large crushed rock. This machine can screen approximately 125 cubic yards of material per hour, and can be operated by one person with a loader. Technical data is attached.

Cost Calculations for Screening Street Sweepings

Calculations are based on Region 1's 1995 figures for street sweepings generated.

ODOT OWNED SHAKER

Shaker Set Up Costs

4 people @ $22.04 hr. X 2 hr. = $176.32

Screening Process Costs

Shaker rental	$20.00 hr.	
Loader	$ 6.50 hr.	
Loader operator	$20.04 hr.	
Laborer	$17.00 hr.	
Street sweepings	7,750 cy.	7,750
Shaker screening rate	200 cy. per hr.	÷ 200
		38.75 hours

Set up cost	2.00 hr. x $88.16 =	$176.32
Shaker rental	38.75 hr. x $20.00 =	$775.00
Loader rental	38.75 hr. x $6.50 =	$251.87
Loader operator	38.75 hr. x $22.04 =	$854.05
Laborer	38.75 hr. x $17.00 =	$658.75
		$2,715.99

"READ SCREEN-ALL" MACHINE

Purchase cost $43,000.00 - $63,000.00 (1 time purchase)

MATERIAL SCREENING COSTS

Loader rental	$6.50 hr.
Loader operator	$22.04 hr.

Street sweepings 7,750 cy.		7,750
Screening rate 125 cy. per hr.		÷ 125
		62 hours

Screen-All set up	1 hr. x $22.04 =	$ 22.04
10 yd. Dump Truck	1 hr. X $ 9.00 =	$ 9.00
Loader rental	62 hr. x $6.50 =	$ 403.00
Loader operator	62 hr. x $22.04 =	$1,366.48
		$1,800.52

MISCELLANEOUS DEBRIS DISPOSAL COSTS

Disposal fee	$55.00 ton
20 yard dump box rental	$155.00 mo.
Dump box hauling	$100.00 per load

Misc. debris = 5% of total street sweepings (in cubic yards)
Misc. debris = 75 lbs. per cy.

388 cy misc. debris x 75 lbs. = 29,100 lbs ÷2,000 = 14.5 tons

Disposal fee 14.5 tons x $55.00 = $797.50
Dump box rental Free with hauling
Dump box hauling $100.00 x 20 loads = $2,000.00
$2,797.50

Sweepings Hauling Cost Estimates by Section are available.
SWEEPINGS HAULING COSTS BY SECTION (Based on estimates by section supervisors.)

District 2A
Clatskanine to Hillsboro 500 cy = 50 loads
Miles 125 RT
Time 5 hours x $22.04 = $110.20
Equip. 5 hours x $9.00 = $ 45.00
$155.20 per load
x 50 loads
$7,760.00

Sylvan to Hillsboro 500 cy = 50 loads
Miles 20 RT
Time 2 hours
Equip 2 hours
Total $3104.00

Manning to Hillsboro 200 cy = 20 loads
Miles 120 RT
Time 5 hours
Equip 5 hours
Total $3,104.00

Baldock to Hillsboro 500 cy =50 loads
Miles 20 RT
Time 2 hours
Equip 2 hours
Total $3,104.00

District 2A Total $17,072.00

District 2B
East Portland to Hillsboro 500 cy = 50 loads
Miles 60 RT
Time 3 hours
Equip 3 hours
Total $4,656.00

North Portland to Hillsboro 1200 cy =120 loads
Miles 50 RT
Time 3 hours
Equip 3 hours
Total $11,174.40

Milwaukie to Hillsboro 250 cy = 25 loads
Miles 60 RT
Time 3 hours
Equip 3 hours
Total $2,328.00

District 2B Total $18,158.40

District 2C
Estacada to Hillsboro 50 cy = 5 loads
Miles 90
Time 5 hours
Equip. 5 hours
Total $776.00

Government Camp to Hillsboro 50 cy - 5 loads
Miles 160
Time 8 hours
Equip 8 hours
Total $1,241.60

Sandy to Hillsboro 1000 cy =100 loads
Miles 90
Time 4 hours
Equip. 4 hours
Total $12,416.00

Cascade Locks to The Dalles 2500 cy = 250 loads
Miles 160
Time 6 hours
Equip. 6 hours
Total $46,560.00

Parkdale to The Dalles 500 cy = 50 loads
Miles 140
Time 5 hours
Equip 5 hours

Total $7,760.00

District 2C Total $67,977.60

APPENDIX D

REPORT ON SELECTED DECANT FACILITIES

By Mark Ghezzi

OFFICE MEMORANDUM...DEPARTMENT OF ENVIRONMENTAL SERVICES

To: Don Newell

From: Mark Ghezzi

Date: 09/26/97

Subject: Decant Site Investigation Summary

On September 17th and 18th, 1997 personnel from Multnomah County and the Oregon Department of Transportation (ODOT) investigated operational decant facilities in the Puget Sound area. The purpose of these visits were to find out what type of technologies are being used by other municipalities and government agencies within the region to help address the problem of road waste disposal.

Site investigations were performed at: (1) Snohomish County located south of Snohomish Valley, Washington. (2) King County located north east of Renton, Washington. (3) And the City of Seattle with facilities located in West Seattle and North Seattle, Washington. (4) In addition to the facilities located in the Puget Sound area I will also include the decant facility operated and owned by the City of Gresham, Oregon in this summary. Personnel attending the Puget Sound area site investigations include; Jeff Moore from the Oregon Department of Transportation, Don Newell and Mark N. Ghezzi from the Multnomah County Transportation and Land Use Planning Division. The City of Gresham site investigation was performed at an earlier date by Wayne Kelsey and Mark N. Ghezzi from the Multnomah County Transportation and Land Use Planning Division.

1) The Snohomish County decant station is one part of a Solid Waste disposal landfill facility located south of Snohomish Valley, Washington. The current operational decant station had a construction cost of approximately 1.5 million dollars in 1995. Snohomish County received a 700 thousand dollar grant from the Washington Department of Transportation to aid the construction cost. A roof for the facility was never constructed due to a lack of funds on the over budgeted construction cost. The facility receives material from *known government agencies and established private sector customers from city contracts within the county. A complete set of design prints can be obtained for this facility, however for the use of this report I will only offer a brief description.

The facility consisted of two levels constructed of concrete. The main level was 79' long and 78' wide. The first 15' of length had a 10% grade toward the back of the slab made of non-skid brushed concrete. The remaining 64' had a 3% grade to the back and a diagonal grade of 2.1% to the drain pit. Specific details on the construction of the drain pit will be left out of this report. See designs for details. Material is decanted in the respective vactor

*known : A documented history of bringing in consistently treatable loads. Such agencies or customers now includes, but not limited in the future to: Snohomish County Roads, Snohomish County Solid Waste, Snohomish County Surface Water, Washington State Department of Transportation and Snohomish County Cities and Towns.

first, weighed on a truck scale and then unloaded on the non-skid area farthest from the drain pit. The material separates as it travels to the drain pit. Once partially separated a scoop piles the material up and is allowed to separate over a period of time. Once dried, the material is relocated to the upper level. It is placed in cells formed by ecology blocks for further drying and storage until disposal. The water entering the drain pit joins the original decanted water from the vactor and is processed by the onsite leachate recovery control system associated with the landfill. Once dried the material is then placed in a landfill. In the past the material was stored on site at the Snohomish County Landfill. When the original landfill was full and capped, a new landfill was constructed adjacently. The newly constructed landfill is not being used at this time because the current County Commissioner would like to have the area surrounding the facility zoned for residential housing. The material is now being shipped out to a Rabanco landfill east of the Cascades at a cost of $40/ton. Snohomish County charges customers a flat $31.60 visit fee for dumping their decant liquid which also covers administrative costs. This fee is charged whether solids are dumped or not. In addition to this fee the customer is charged $51.00/ton for solids delivered to the facility. The disposal fees were created in an effort to pay for the construction and operational price of the facility, however at the present time they are losing money and in the process of increasing disposal fees.

The Decant facility works well and meets the disposal needs for Snohomish County and their users. The facility's design allows for a turn around time of 4-10 days pending weather from time of drop off until it is ready to be disposed of at a landfill. There are a few key design features that allow for this quick turn around rate. The first key feature is the long 3% back slope and the 2.1% diagonal slope. These long slopes allow the material to travel a great distance and separate in the process. Second, after the initial water has run off, the piling of the material allows gravity to help drive out the excess water. The third feature is storing the material in the ecology block cells. This allows the material to dry further in a location that directs the water to the drain pit for treatment while waiting to be shipped and disposed of. One key design feature that would aid the turn around time would be construction of the initially planned roof. This would prevent the wet weather conditions from the Pacific North West from prolonging unnecessary processing time. One other design feature that would be helpful to the operation of the facility would be a small lip at the beginning of the 10% non-skid sloping concrete slab. This feature would help contain the material to the slab. Many of the maintenance workers commented that the material quite often splashes forward during the unloading process depending on the consistency of the load. Running heated piping under the slab fueled by the methane emissions from the adjacent landfill could also be a possible method of speeding up the drying process.

This facility appears to work well for Snohomish County. The existing leachate recovery control system helps the onsite processing of the decant liquid. This is an option that most agencies do not have. If possible, construction of a decant station with such a treatment facility associated with it would be beneficial. However, I feel this level of treatment is not necessary to meet regulatory requirements.

2) The King County decant facility is located outside of the city of Renton, Washington at one of the King County Roads Department quarry's. The decant station consists of an asphalt lift with a 3-5% central slope and a 1% cross slope to the drainage system. The lift is designed to drain centrally from one side into a series of manholes. Attached to the decant station is a truck wash for cleaning the vactors and an oil/water separator. The building is 160' by 50' and is divided in to multiple sections by ecology blocks. Each section is designated for various types of waste and by generators. King County paved the asphalt lift themselves and contracted the building/roof structure of the facility at an estimated cost of 192 thousand dollars. A bid of 14 thousand dollars has just been accepted by King County for the construction of an underground baffle system. In the future King County will be constructing smaller versions of this decant station around the county. The Decant station receives material from the King County Roads Department and the City of Renton Roads Department. This plant processes an estimated 5,000 tons of material annually. A loaded vactor first decants the water from the truck and discharges it into the drain. The vactor operator then proceeds to a truck scale and weighs in. Once weighed the load is dropped in the appropriate ecology block cell. After removing the material, the vactor is cleaned and weighed empty. The material is turned over and stacked inside the cells as needed to keep it piled up. The decanted water

makes its way to the drain pipe and into the manhole system. After the decanted water effluent passes through the manhole system it is discharged in to an existing sanitary sewer line. The dried material is removed and disposed of in a landfill at a price generally between 30 and 50 dollars per ton. In the future, street sweepings may be handled in a similar fashion after pre-screening treatment. However this is still under investigation.

This design incorporates some good ideas. The slopes guide the decanted water to the drainage system a rate which allows for separation. The ability to move walls constructed of ecology blocks make the system more versatile while maintaining the integrity of the decanting system. The sanitary sewer line should be adequate to treat any parameters present in the effluent discharge to meet regulatory requirements. The largest concern regarding the effluent discharge would probably be the amount of suspended particles entering the sanitary sewer line. Future considerations may need to be taken to incorporate some type of control system for containing suspended particles. This may be accomplished by the recently designed underground baffle system to be constructed in the upcoming year. Over all this decant station appears to work well for the price of construction. My only concern for this facility is the shared liability between the City of Renton and King County in case of a contaminated load. This facility is equipped with concrete vaults to contain such loads until proper disposal methods can be determined. My only recommendation for this facility is to construct a two foot wall along the back two sides of the decant station to contain run-off and direct all decanted water to the drainage system.

3) The City of Seattle currently has two operational decant stations that process vactor waste generated by the City of Seattle Roads Department. The primary station is located in West Seattle and the secondary station in the Halliday area of North Seattle. Both of these decant stations have dramatically different designs than previous facilities mentioned in this report.

The West Seattle decant station is a pit approximately 30' x 15' x 15' (length x width x depth). Vactor waste is loaded into the pit and allowed to separate over a long period of time. Decanted liquid passively travels to a drain three feet down in the pit. The liquid then passes through a large screen to catch debris from clogging the drainage system . The drainage system consists of a series of manholes and sumps. The decant liquid is then discharged into the sanitary sewer line. Solid material from the pit is removed by an excavator and placed in ecology-block cells until transport to a landfill for disposal. This station was constructed by the City of Seattle at an estimated cost of 40 thousand dollars. Landfill disposal fees for the solid material is generally between 30 and 50 dollars per ton.

The Halliday decant station is a 30' x 15' x 15' (length x width x depth) pit with a 30' ramp entering the pit. A custom made mobile truck box is placed inside the bottom of the pit. This box is designed to receive the vactor waste and decant the liquid through a system of drain pipes. After the decanted liquid exits the box it separates again in the pit and debris is screened before entering the sanitary sewer line. When all liquid has been decanted the loaded box is removed from the pit. The remaining material in the pit is removed by a scoop and placed in the box. The box is then stored onsite until transport to a landfill for disposal. This station was constructed by the City of Seattle at an estimated cost of 30 thousand dollars. The truck boxes were designed by Capital Industries, Inc., however a construction price was not available.

Both of these facilities did not work as well as originally planned. The drainage systems needed constant attention and maintenance at both facilities. The screening system at the West Seattle decant station allowed material and debris into the drainage system requiring back flushing and removal on a regular basis. The truck box drain pipes clog easily and prevents the liquid component of the vactor waste from decanting effectively at the Halliday decant station. Here too the system needed back flushing to remove debris from the drainage system before entering the sanitary sewer line. Both of these facilities require redesigning and the appropriate retrofitting in order to operate efficiently.

4) The City of Gresham has a newly constructed decant station located in Gresham, Oregon. This facility serves the City of Gresham Street Maintenance and Storm water Divisions. The Gresham Decant station consists of a concrete slab, a truck washing station and an underground baffle system that feeds into the sanitary sewer line. The decant portion of the concrete slab is approximately 40' x 60' with a 3% central slope to a drainage line. The decant station receives vactor material on the sides from short docking bays. The material is accessed from the front of the decant station to be turned and pilled. The decanted liquid drains into the central drainage line and into the baffle system. The baffle system is accessed by manholes and two large metal plates. After passing through the baffle system, decanted liquid is discharged into the sanitary sewer line.

This facility does not work as well as the City of Gresham would like. The vactor waste is too fluid to work in this design. The concrete slab is too steep at 3% and too short with a 20' travel distance to the drainage line. The decant station does not separate the liquid and solid components adequately and the baffle system requires cleaning often. The City of Gresham has tried using Bio-Bags to slow the rate of movement in order to allow more time for the material to separate. This has been somewhat effective but still not efficient enough to meet their disposal needs. Since the decant station has been in operation the amount of material processed has drastically decreased. The City of Gresham is now reviewing the decant station design in an attempt to increase its efficiency.

Summary

During our investigation, observations of key design features responsible for high efficiency operations were made. The use of small slopes between 1%-3% over distances of 40'-60'+ seemed to allow adequate time for separation of most vactor waste. However, in some cases media such as bio-bags or mulch may be needed to slow the rate of movement depending on the consistency of the material and design of facility. After initial separation, pilling of the material allows gravity to help drive out excess liquid. Storage of this material in a covered dry area that allows for drainage will ensure complete separation of the liquid and solid components of the waste. The use of ecology-blocks for temporary walls and storage cells made these facilities more versatile to handle various needs. Drainage systems need to be easily accessible for cleaning and incorporate a filtration system for removal of debris.

Proposal

After taking part in the decant investigations and reviewing parameters present in vactor waste generated by the Multnomah County Transportation and Land Use Planning division, I would like to offer a few comments and design ideas for the construction of a decant facility by Multnomah County. A long 1%-3% sloped slab or lift of impervious material with an associated drainage system would be appropriate. The longer distance of travel and greater surface area, the larger amount of time the solid and liquid components of the waste will be allowed to separate. A series of easily accessible screens should be used to remove debris and prevent clogging of the drainage system. A baffle system would also be appropriate. This would allow a secondary system to remove any suspended solids from the decanted liquid. There have been no chemical parameters of concern present in laboratory reports requiring treatment of the liquid component before discharge into a sanitary sewer line. Total Petroleum Hydrocarbons (TPH) have been present, however these parameters will affix to the solid component of the waste. Discharge requirements into the sanitary sewer line should be met by removing the suspended solids from the decanted liquid. A specific investigation should be done with state and federal regulatory agencies to confirm sanitary sewer discharge requirements.

Mark N. Ghezzi

cc: Bob Thomas, Don Hauskins, Mike Snyder, Jeff Moore

APPENDIX E

REPORT ON SELECTED OREGON DECANT FACILITIES

by Jay Collins

Roadwaste Management Options
ODOT Research Project No. 385

A VISIT TO OREGON DECANT FACILITIES
January 20, 1998

As recorded by Jay Collins, Principal Investigator, ODOT

On January 20, 1998, Doug Pierce from WsDOT and Tony Barrett from Washington DOE joined Don Newell from Multnomah County, Jeff Moore from ODOT Clean Water Section, and Jay Collins from ODOT Research Unit on a tour of three Oregon decant facilities.

Lane County Decant Facility at Glenwood

Lane County partnered with the City of Springfield and the City of Eugene to build a vactor waste decant facility in centrally located Glenwood, Oregon. The urban Eugene-Springfield area has a population greater than 175,000. Each agency was represented on the design team. This team reviewed the designs of a variety of decant facilities in the Northwest and adopted the construction design for the Lane County facility. The facility cost $250,000 to construct and began operating in October 1996. A $250 per load dump fee for the partners covers ongoing operational costs and improvements.

We met with Doug Putschler, Road Maintenance Manager for Lane County Public Works, on site at 10:30 AM. The facility has an 80' square, sloped, concrete pad with walls on three sides (illustrations and a photograph log are attached). A concrete water collection trench runs from the center of the back wall most of the way across the pad. This trench is sided by hay bails at the back and by curbing that limits drainage to the trench. These features help to drop solids out of solution. Boards form a dike that separates the main collection trench from the outflow point. A small tube allows water to flow from the main trench into the outflow chamber prior to gravity piping to an underground tank for final settling. Wastewater is drawn off this tank and is disposed into a high flow sanitary sewer connection on site. A high roof covers the pad to keep rainfall off the drying vactor wastes and to reduce stormwater accumulation.

Three to four loads per day are dumped at the facility. Vactor trucks dump waste from the high point at the rear of the pad. Once the material is semi-solid, a front loader is used to move the waste from the dumping side to deeper, 4' high piles on the solids drying side. Piling the wastes increases pressure, which encourages further dewatering. They are weighing loads coming in and going out to calculate the percentage water removed. However, changes to operations have made this determination difficult, so far. Solids are mixed into the garbage at the adjacent solid waste handling facility and are taken to a sanitary landfill.

In the field, vactor trucks decant the identifiable water fraction into specified high-flow sanitary sewers. These high-flow sewer sites were selected to eliminate the need for pretreatment (e.g., suspended solids removal). Eugene spearheaded discussions with sanitary sewer authorities; four locations in Eugene are in use. Three field decant sites to the sanitary sewer are expected to be approved soon in Springfield.

This decant facility has agreed in principle to accept waste from one private company. However, coming up with an appropriate dump fee for parties who did not participate in construction costs has stalled their participation. Lane County and the Cities are interested in ODOT as a potential partner in this facility.

As operations continue at the facility, possible improvements to the facility's design are identified. Mr. Putschler has very little time to devote to oversite of the facility, but several positive changes have been made. While the County is not yet entirely happy with how the facility runs, some problems were expected, and they are making it work. Doug shared the following comments:

> Plans are set to build an asphalt berm around the truck dump area. This will route vactor truck slop back into the treatment area through a slot to be cut in the back wall.
>
> They want to raise the back wall 3-4'. (At the time of the visit, the final dewatering piles nearly filled their area. Higher walls should allow higher stacking, which would increase storage/treatment capacity and should promote more efficient dewatering.)
>
> The slope on the dewatering pad is such that the front loader has to drive through the muck to get at the solids. This means that when the front loader leaves the area, the tires must be washed. A pad that slopes to the back would be better for placement of wastes and the majority of the solids would be easier to remove. The slight dish at the front of the pad would not be required, either, as the walls would provide the containment. This would allow for a longer dewatering slope on the same size pad.
>
> They have tried a variety of outflow pipe configurations from the trench outflow area. Shortly after operations began, the County installed a standpipe permitting only overflow to enter the pipe to the underground tank. This allowed the outflow area to act like an oil/water separator -- providing another settling point -- and reduced clogging in the pipe. What has worked best is a perforated standpipe. The perforations plug as solids accumulate in the trench outflow area, gradually moving the outflow point up the pipe. This also offers a visual check on how much material has accumulated.
>
> They are still experimenting with detention barriers to more efficiently drop out suspended solids onto the pad.

The line from the settling trench to the underground tank sometimes clogs, but this line (6" or possibly 8") is easy to blow out with vactor trucks. It does require maintenance but is not considered a design problem.

Management of the facility has also become an issue. Having sited the facility at an existing solid waste handling yard, the partners thought that Lane County Solid Waste would naturally take over management of the facility once it was constructed. This has not been the case. Operations have gradually improved, offering more efficient treatment and better performance for crews. However, solid waste or wastewater management professionals may be a more natural fit for management of such facilities.

Don Newell said that the facility's design would be useful for storage of sand or other roadway materials if its use as a decant facility was seasonal.

Mr. Putschler agreed to participate in ODOT's roadwaste management study, forwarding information on Lane County's vactor waste volumes, waste characterization (analyses), and the facility design plans.

Marion County Decant Facility at Brooks

We met with D.H. Garland from Marion County at the decant facility in Brooks at 1:30 PM. The pad is 45' square, with two settling tanks, and is operated without a roof. The construction cost was $44,000. The facility gets 3 to 4 loads per week from the County and began operating in November 1997. Marion County does not field decant from their vactor trucks, so their loads have a high water content. They are interested in reducing the amount of water in their loads.

Most of the solids fall out where the material is unloaded to the pad. Liquid is kept from running off the pad by three short concrete walls and a sloped entrance. A slight slope also runs from left to right across the pad, and grating running along the right-hand wall is the outflow collection point. At one point, absorbent pads were placed on this grating to trap more solids and any oils. The liquids then flow into two underground storage tanks in series for more settling. Absorbent pads are maintained in the first tank to remove oil. The effluent is discharged to the immediately adjacent City of Brooks wastewater treatment lagoons.

So far, only a small amount of solids have accumulated. Once they need to be cleared away and solids removed from the tanks, Marion County plans to take the wastes either to the Marion County Landfill and/or to a thermal desorption facility (petroleum-contaminated soil burner) located in N. Marion County.

Marion County is not interested in sharing the facility, both due to size constraints and to concerns voiced from the City of Brooks regarding hazardous waste liabilities from hot loads.

Bruce Visser, Emergency and Environmental Manager for Marion County Public Works, would change the slope of the pad. He also intends to place some kind of barrier on the pad, perhaps an old fire hose filled with rock, to act as an obstacle to get more solids to fall out before the drain trench. They also are considering the possibility of roofing the facility.

Mr. Visser provided facility design plans for ODOT's roadwaste management study (attached).

Unified Sewerage Agency (USA) Dewatering Facility at Rock Creek WWTP

We met Ted Clausen, SWM Maintenance Supervisor, at the USA offices in Hillsboro at 3:15 PM. We then traveled to Rock Creek Wastewater Treatment Plant (Rock Creek WWTP), an impressive and modern WWTP complete with aerobic digesters and tertiary treatment for nitrogen and phosphorous compounds.

Very little money had been put into the vactor decant facility, but Mr. Clausen said that it worked better than any facility so far. Field decant of identifiable liquids is done into three field decant stations. These stations are sanitary sewer connections with 3-stage vaulted settling chambers on the front end to help remove suspended solids to avoid plugging. USA plans to establish three more field decant stations in each of the next two years and operate nine in total. The vactor trucks come into Rock Creek WWTP in the evening and sit overnight to allow more settling. Identifiable water is decanted to the WWTP prior to placement of the remaining vactor wastes in the dewatering area.

The dewatering area is very simple: a drain is located toward the back; long concrete blocks are stacked to form walls on three sides; vactor trucks dump waste on the pad; liquids run towards the drain. (The dewatering area shares a common wall with a similarly designed area used for dewatering of treated WWTP sludge. The WWTP sludge had a noticeable odor.) Dewatered wastes are removed with front loaders. USA disposes the solids at Hillsboro landfill at a cost of $60 per ton. Liquids are piped into Rock Creek WWTP for treatment.

Mr. Clausen said that USA plans to put more money into improving the dewatering facility now that they know this operation will remain on site for a few years.

Mr. Clausen was asked if they have plans to install a roof over their facility. He said that USA is looking into it, but the price tag for an 18' roof was a lot of the cost of building a new facility. Roof pluses and minuses were discussed. The main drawback sited was cost. Don Newell offered the suggestion of covering the final dewatering area only. This would eliminate the need for a high roof to accommodate the vactor trucks, providing much of the benefit of a roofed facility at a fraction of the usual cost. Mr. Newell suggested an exaggerated slope, starting at 5 to 7%, going to 3%, and ending at 2%. The solids would be pulled out and dewater under cover.

Ted Clausen said that USA was interested in partnering with ODOT, allowing use of the field decant stations and/or the dewatering facility for a fee. He said that the City of Beaverton operates a decant facility but the City has not been open to partnering. He also said that Forest Grove has an interesting way of dewatering their vactor wastes, using dumpsters. Jeff Moore said that he heard that New York City was using something similar and liked the operational flexibility and performance of the units.

Jay Collins requested information for ODOT's study on USA's vactor waste volumes, waste characterization (analyses), and any facility plans.

APPENDIX F

SAMPLE DE-WATERING FACILITY AND FIELD DECANT STATION DESIGNS

F1. Lane County's Facility Design
F2. Marion County's Brooks Facility Design
F3. City of Gresham's Facility Design
F4. Flo Trend Systems (proprietary) Filter Containers for Vactor Sludge De-watering
F5. Unified Sewerage Agency (USA) Field Decant Station Design

INDEX OF SHEETS		
SHT. NO.	DRAWING NO.	DESCRIPTION
1		Title Sheet
2		Site Plan
3		Grading And Paving Plan
4		Piping Plan
5		Foundation Plan
6		Structural Sections
7		Roof
8		Miscellaneous Sections
9		Miscellaneous Details
10	LTS-101	Junction Boxes
		O.S.H.D. STANDARD DRAWINGS
11	2050	Miscellaneous Structures
12	2050A	Miscellaneous Structures
13	2091A	Pipe Backfill/Compaction
14	2105	Concrete Inlets

LANE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

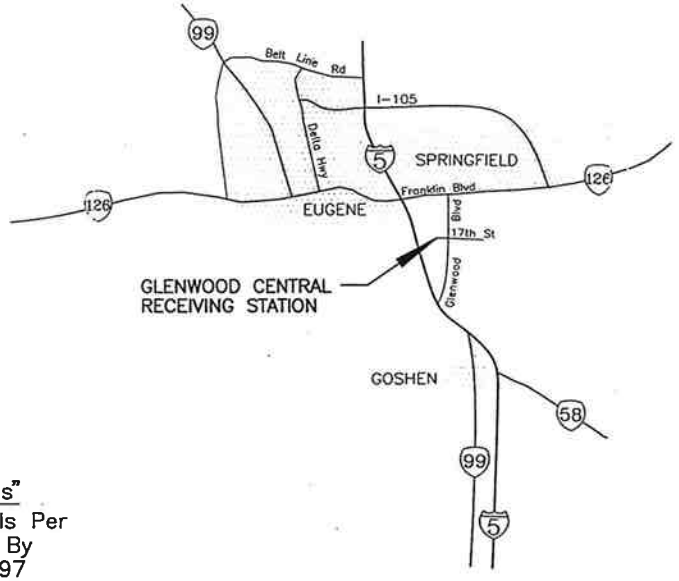
PLANS FOR PROPOSED PROJECT

GRADING, BASING, PAVING & STRUCTURE

VACTOR WASTE DISPOSAL FACILITY

AT GLENWOOD CENTRAL RECEIVING STATION

MARCH 1997



NO SCALE

REGISTERED PROFESSIONAL ENGINEER
11,754
OREGON
JULY 16, 1982
OLIVER P. SNOWDEN

Expiration Date 6/30/98

"As Constructed Plans"
As Constructed Details Per
Information Provided By
Dan Ingram 12-24-97
Drafted By: MJS 6-9-98

LANE COUNTY COMMISSIONERS
CINDY WEELDREYER, CHAIR
STEVE CORNACCHIA, VICE CHAIR
ELLIE DUMDI
BOBBY GREEN
PETER SORENSON

DIRECTOR, DEPT. OF PUBLIC WORKS
JOHN E. GOODSON

COUNTY ENGINEER
OLIVER P. SNOWDEN

CONTRACT NO. 96/97-06
ROAD NO.
ACCOUNT NO. 96806

F1-1

LANE COUNTY DEPARTMENT OF PUBLIC WORKS			
VACTOR WASTE DISPOSAL FACILITY			SHEET NO. NA
DATE	PROJECT NO.	ROAD NO.	
March 1997	96806	M.-- NA	

"As Constructed Plans"

SUMMARY

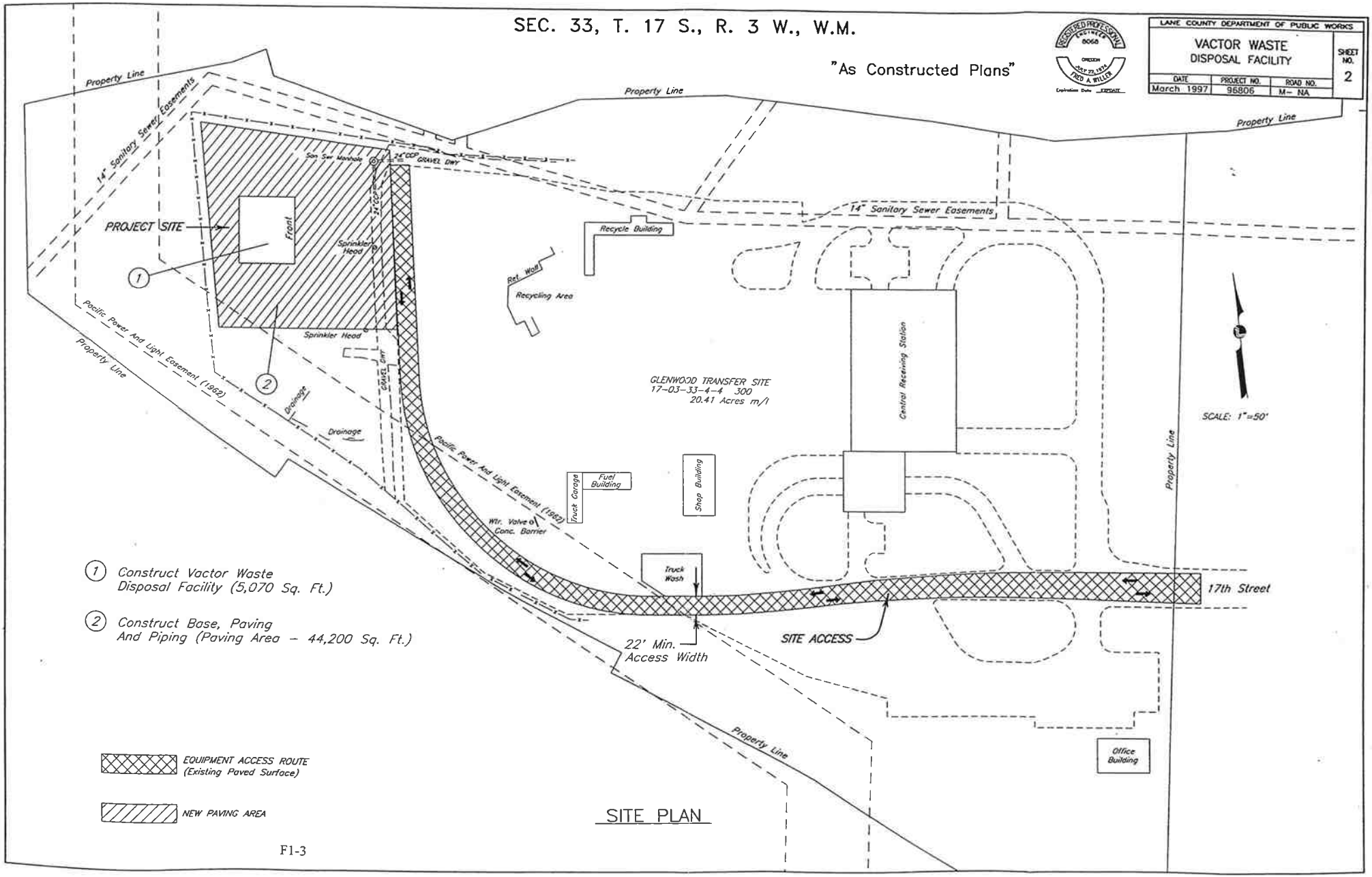
STD. SPEC. NO.	ITEM NO.	ITEM	UNIT	QUANT.	*FINAL QUANT.*
		MOBILIZATION AND TRAFFIC CONTROL			
	1	Mobilization	Lump Sum	All	*100%*
	2	Removal Of Structures And Obstructions	Lump Sum	All	*100%*
	3	Clearing	Lump Sum	All	*100%*
	4	Site Grading	Lump Sum	All	*100%*
	5	Foundation Excavation	Cu. Yd.	1850	*1264.9*
	6	Engineered Fill	Ton	3500	*2422.32*
	7	Watering	M-Gal	100	*68.7*
	8	6-Inch Drain Pipe	Lin. Ft.	170	*153*
	9	8-Inch Storm Sewer Pipe	Lin. Ft.	170	*172*
	10	12-Inch Culvert Pipe	Lin. Ft.	250	*250*
	11	Concrete Manholes	Each	3	*4*
	12	Inlet	Each	2	*2*
	13	Manhole Cut In	Each	1	*1*
	14	Grease Trap	Each	1	*1*
	15	Adjusting Manhole	Each	1	*1*
	16	Reinforcement	Lump Sum	All	*100%*
	17	Structural Concrete	Lump Sum	All	*100%*
	18	1 1/2"-0" Aggregate Base	Ton	1600	*1424.45*
	19	3/4"-0" Aggregate Base	Ton	500	*653.13*
	20	Standard Duty Class B Asphalt Concrete	Ton	1100	*1086.36*
	21	1 1/2-Inch Conduit	Lin. Ft.	530	*529*
	22	Junction Box	Each	1	*1*
	23	2" Water Pipe	Lin. Ft.	480	*533*
	24	6" Pipe Saddle Con.	Each	1	*Deleted*
	25	2-Inch Gate Valve	Each	3	*3*
	26	Pre-Engineered Structure	Lump Sum	All	*100%*
	27	Drainage Curbs	Lump Sum	415	*405*
	PA	Pea Gravel	Ton	–	*154.06*

SEC. 33, T. 17 S., R. 3 W., W.M.

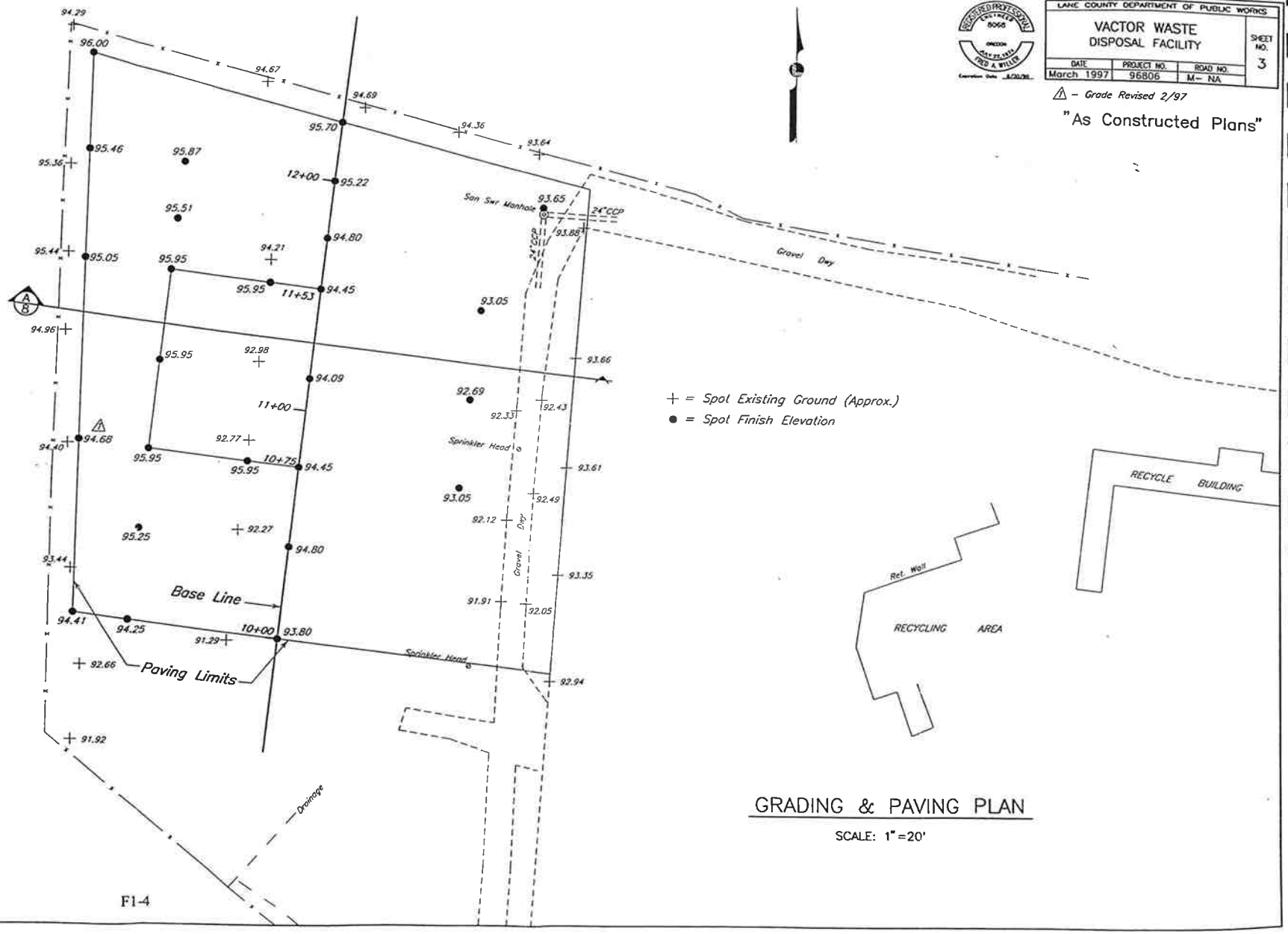
"As Constructed Plans"

REGISTERED PROFESSIONAL ENGINEER 8068 OREGON JULY 27, 1978 FRED A. WELLER Expiration Date: 12/31/97

LANE COUNTY DEPARTMENT OF PUBLIC WORKS			
VACTOR WASTE DISPOSAL FACILITY			SHEET NO. 2
DATE	PROJECT NO.	ROAD NO.	
March 1997	96806	M- NA	



SITE PLAN



LANE COUNTY DEPARTMENT OF PUBLIC WORKS

VACTOR WASTE DISPOSAL FACILITY

SHEET NO. 3

DATE	PROJECT NO.	ROAD NO.
March 1997	96806	M- NA

⚠ – Grade Revised 2/97

"As Constructed Plans"

GRADING & PAVING PLAN

SCALE: 1" = 20'

F1-4

GRADEPAV.DWG

(1) Install 8" Sewer Pipe – ~~76'~~ 77'
(For Details, See Sht. No. 9 And Dwg. No. 2091A).

(2) Construct Manhole
F.L. 8" In/Out El. 90.40
(See Dwg. No. 2050 And 2050A).

(3) Install 8" Sewer Pipe – ~~56'~~ 46'

(4) Install ~~3,200~~ 3,000 Gallon Grease Trap – ~~1~~ 2 Each; Construct Access Manholes – 2 Each (For Details, See Sht. No. 8 And 9). 4–A, 4–B, 4–C

(5) Install 8" Sewer Pipe – ~~36'~~ 23'

(6) Construct Manhole Cut–In – 1 Each
(For Details See Sht. No. 9)
Adjust Manhole – 1 Each
(For Details, See Sht. No. 9).

(7) Install 12" Culvert Pipe – 138'
(See Dwg. No. 2091A).

⚠ (8) Install 2'x2' Inlet, Inlet Shall Comply With Ore. Plumbing Specialty Code – 1 Each;
F.L. 12" In/S. El. 89.90
F.L. 12" Out/N. El. 89.90

(9) Install 6" Drain Pipes, 2 @ ~~84'~~ 76' ~~168'~~ 153' Total); Provide Elbows/Fittings For Connection To Downspouts. Install With Minimum 1' Subgrade Cover.

(10) Install 1 1/2" Electrical Conduit, 2 @ 165' (330' Total) With 90° Elbow Each End.

(11) Install Type 2, Concrete Junction Box With PCC Apron – 1 Each
(See Dwg. No. LTS–101).

(12) Install 1 1/2" Electrical Conduit – ~~260'~~ 199' With 3 – 90° Elbows. Repair Pavement Cuts With Like Materials.

(13) ~~Install 6" Pipe Saddle For 2" Galv. Pipe Nipple.~~
Install 2" Tee

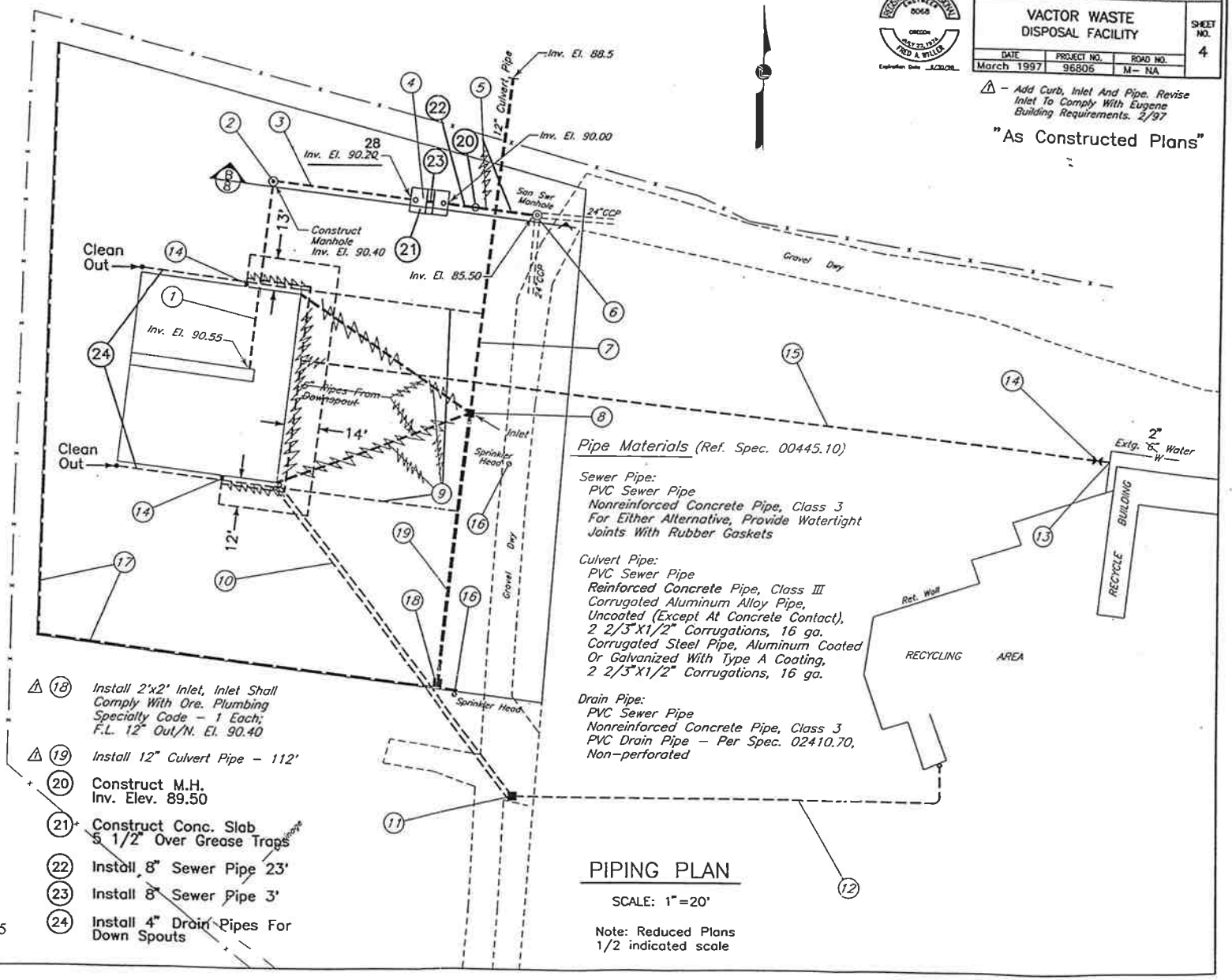
(14) Install 2" Gate Valve With Galv. Nipple And Union At Each End. Install Valve Box.

(15) Install 2" PVC Water Pipe With Required Fittings – ~~480'~~ 523'
Place 1 Cu. Ft. Concrete Thrust Block At All Elbows And Tees.
Repair Pavement Cuts With Like Materials.

(16) Remove Abandoned Irrigation System Within Consruction Limits.

⚠ (17) Construct P.C. Conc. Drainage Curb – ~~415~~ Lin. Ft. 405'
(See Dwg. No. 2077)

F1-5



⚠ (18) Install 2'x2' Inlet, Inlet Shall Comply With Ore. Plumbing Specialty Code – 1 Each;
F.L. 12" Out/N. El. 90.40

⚠ (19) Install 12" Culvert Pipe – 112'

(20) Construct M.H.
Inv. Elev. 89.50

(21) Construct Conc. Slab 5 1/2" Over Grease Traps

(22) Install 8" Sewer Pipe 23'

(23) Install 8" Sewer Pipe 3'

(24) Install 4" Drain Pipes For Down Spouts

Pipe Materials (Ref. Spec. 00445.10)

Sewer Pipe:
PVC Sewer Pipe
Nonreinforced Concrete Pipe, Class 3
For Either Alternative, Provide Watertight Joints With Rubber Gaskets

Culvert Pipe:
PVC Sewer Pipe
Reinforced Concrete Pipe, Class III
Corrugated Aluminum Alloy Pipe, Uncoated (Except At Concrete Contact), 2 2/3"X1/2" Corrugations, 16 ga.
Corrugated Steel Pipe, Aluminum Coated Or Galvanized With Type A Coating, 2 2/3"X1/2" Corrugations, 16 ga.

Drain Pipe:
PVC Sewer Pipe
Nonreinforced Concrete Pipe, Class 3
PVC Drain Pipe – Per Spec. 02410.70, Non–perforated

PIPING PLAN

SCALE: 1"=20'

Note: Reduced Plans 1/2 indicated scale

REGISTERED PROFESSIONAL ENGINEER 8068 OREGON JULY 23, 1976 FRED A. WILLER Expiration Date: 6/30/98

LANE COUNTY DEPARTMENT OF PUBLIC WORKS

VACTOR WASTE DISPOSAL FACILITY

SHEET NO. 4

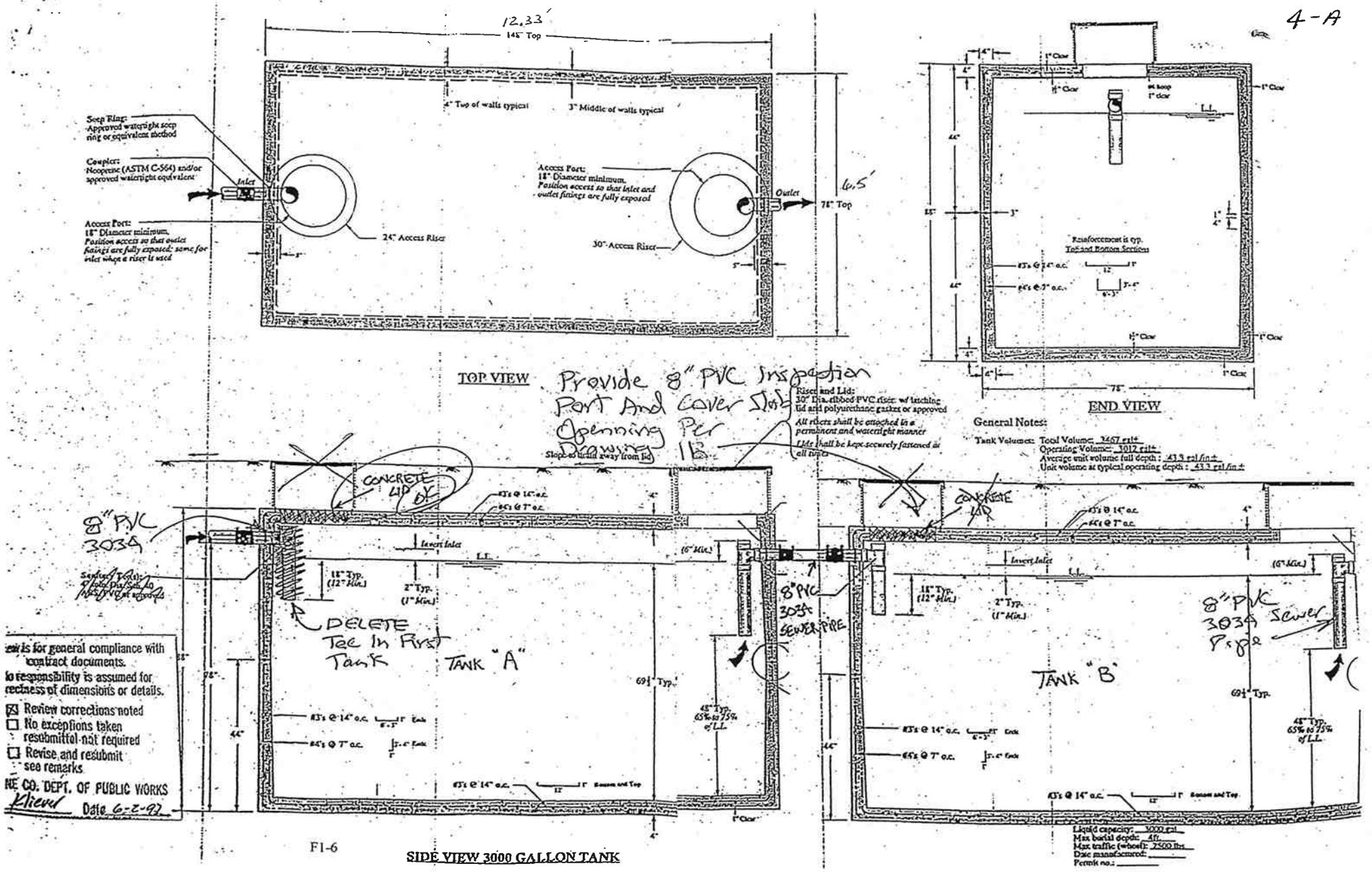
DATE	PROJECT NO.	ROAD NO.
March 1997	96806	M– NA

⚠ – Add Curb, Inlet And Pipe. Revise Inlet To Comply With Eugene Building Requirements. 2/97

"As Constructed Plans"

PIPING.DWG

4-A

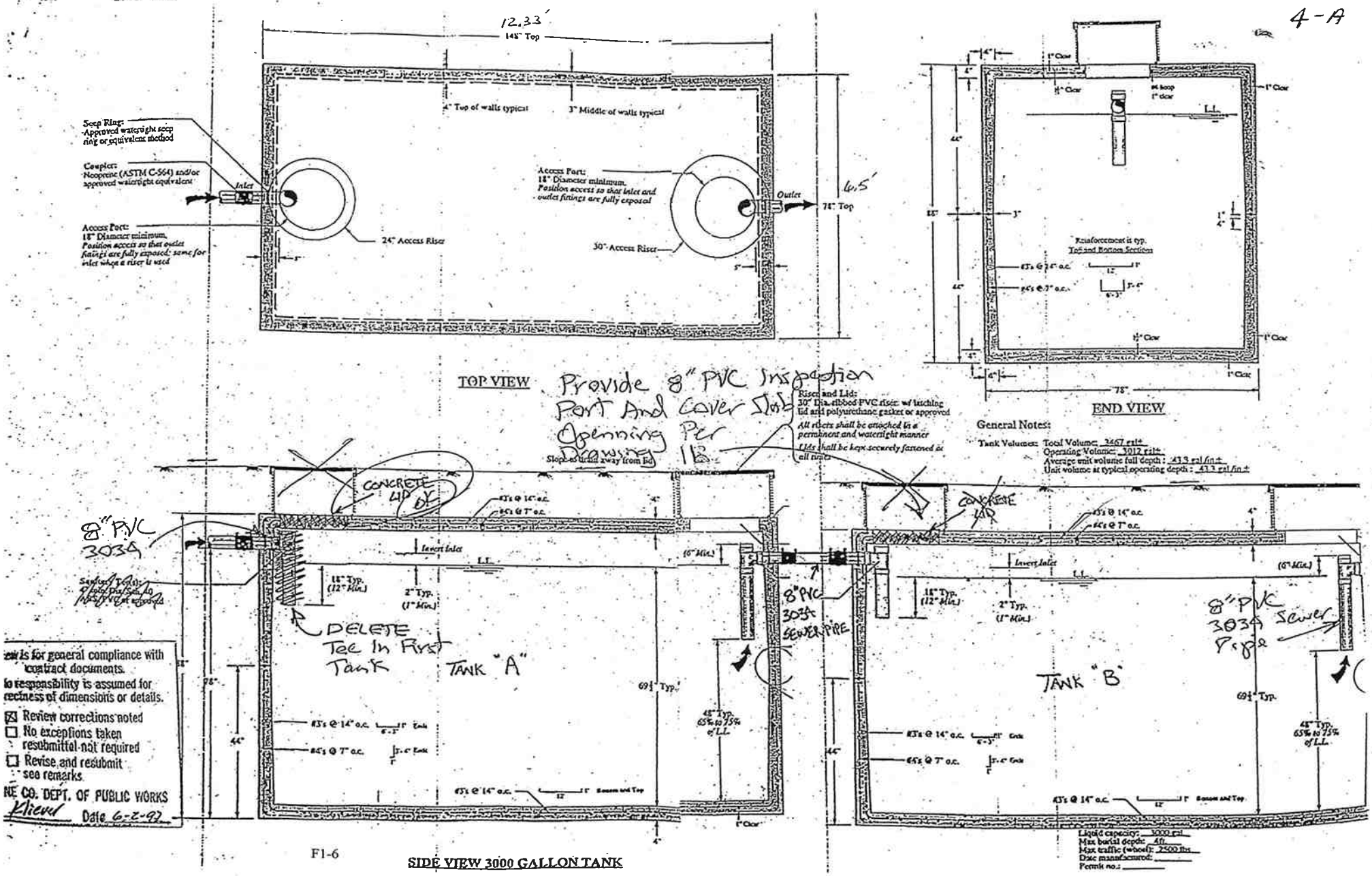


is for general compliance with contract documents.
o responsibility is assumed for rectness of dimensions or details.
☒ Review corrections noted
☐ No exceptions taken resubmittal not required
☐ Revise and resubmit see remarks
NE CO. DEPT. OF PUBLIC WORKS
Klievet Date 6-2-97

F1-6

SIDE VIEW 3000 GALLON TANK

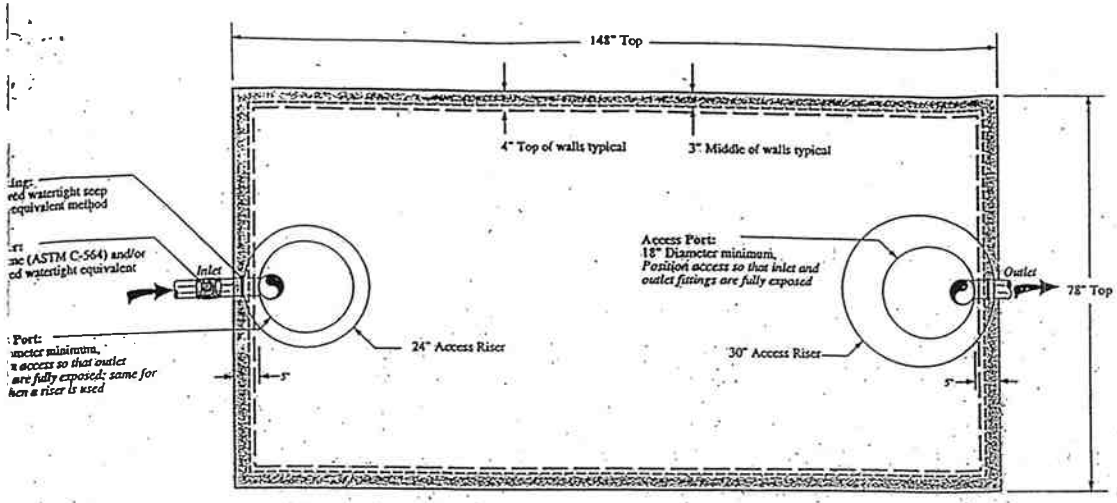
4-A



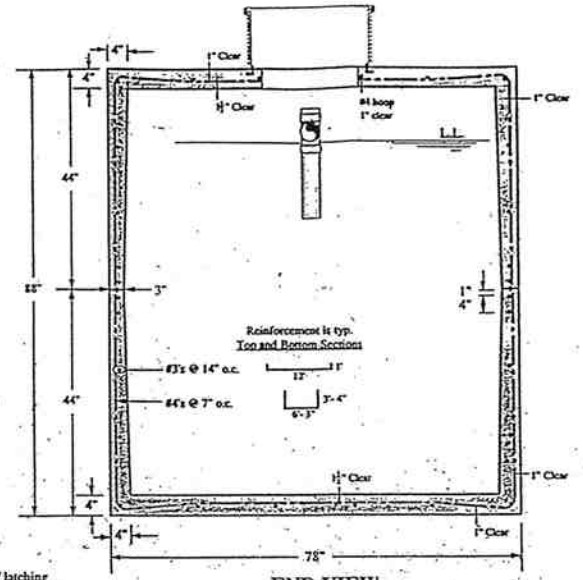
is for general compliance with contract documents.
no responsibility is assumed for correctness of dimensions or details.
☒ Review corrections noted
☐ No exceptions taken resubmittal not required
☐ Revise and resubmit see remarks
NE CO. DEPT. OF PUBLIC WORKS
Kliewer Date 6-2-97

F1-6

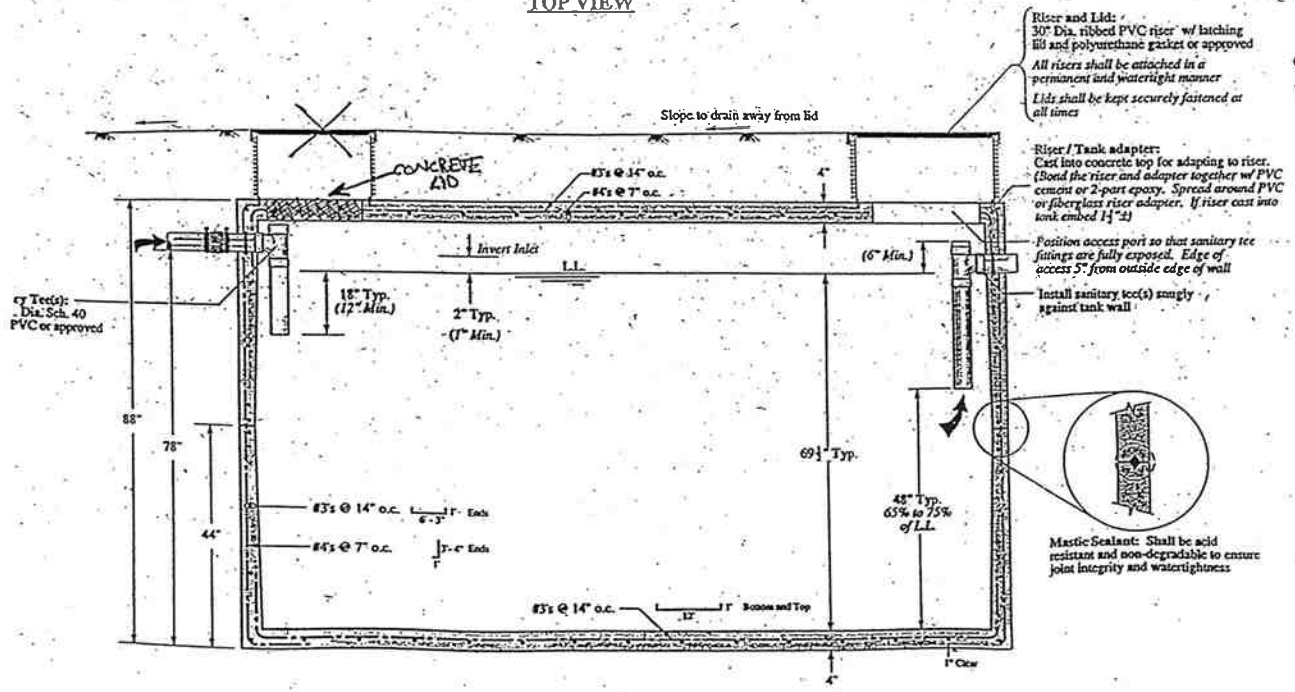
SIDE VIEW 3000 GALLON TANK



TOP VIEW



END VIEW



F1-7 SIDE VIEW 3000 GALLON TANK

General Notes:

Tank Volumes: Total Volume: 3467 gal±
Operating Volume: 3012 gal±
Average unit volume full depth : 43.3 gal/in.±
Unit volume at typical operating depth : 43.3 gal/in.±

Loads: Top = 400 psf
Lateral Load = 62.4 pcf
Concentrated Wheel Load = 2500 lb.
The septic tank shall be capable of withstanding long-term hydrostatic loading, in addition to the soil loading, due to a water table maintained at ground surface.
Soil Bearing = 1500 psf *(re-evaluate support base if soil bearing is less or unequal)*

Concrete: The walls and bottom slab shall be poured monolithically.
Reinforcing steel shall be ASTM A-615 Grade 60, fy = 60,000 psi.

The concrete shall achieve a minimum compressive strength of 4,000 psi in 28 days; fc = 4,000 psi. Concrete shall be ready mix with cement conforming to ASTM C-150, Type II. There shall be a content of not less than six and one half (6 1/2) sacks per cubic yards and maximum aggregate size of 3/4 inch. Water/Cement ratio shall be kept below 0.4, (W:C 0.35±). Air-entraining agents and fibrous reinforcement will enhance workability, curing and watertightness of the tank; however, their usage is optional.

Tanks shall not be moved from the manufacturing site to the job site until the tank has cured for seven (7) days, or has reached two-thirds of the design strength. Proper curing techniques must be used to ensure watertight tanks.

Installation: Installation, bedding, compaction, etc., shall be in strict compliance with the manufacturers standards and state of Oregon's on-site rules 340-71 and 73. All tanks shall be set level on a minimum 3 inch thick compacted sand or approved granular bedding overlying a firm uniform base. The base shall be stable and uniform in order to ensure equal bearing across the tank bottom. Installations with 48 inches or less of ground cover may require additional buoyancy considerations as described in the manufacturers instructions. A minimum cover of 12 inches is required over the tank in areas subject to occisional light wheel loads.

Seamed wall construction, when possible, should be restricted to sites where temporary or permanent groundwater levels remain below the seam. Ground water separation criteria below seam should also be satisfied.

Test: Tanks shall be tested and certified watertight per Oregon On-Site Rules 340-71 and 73.

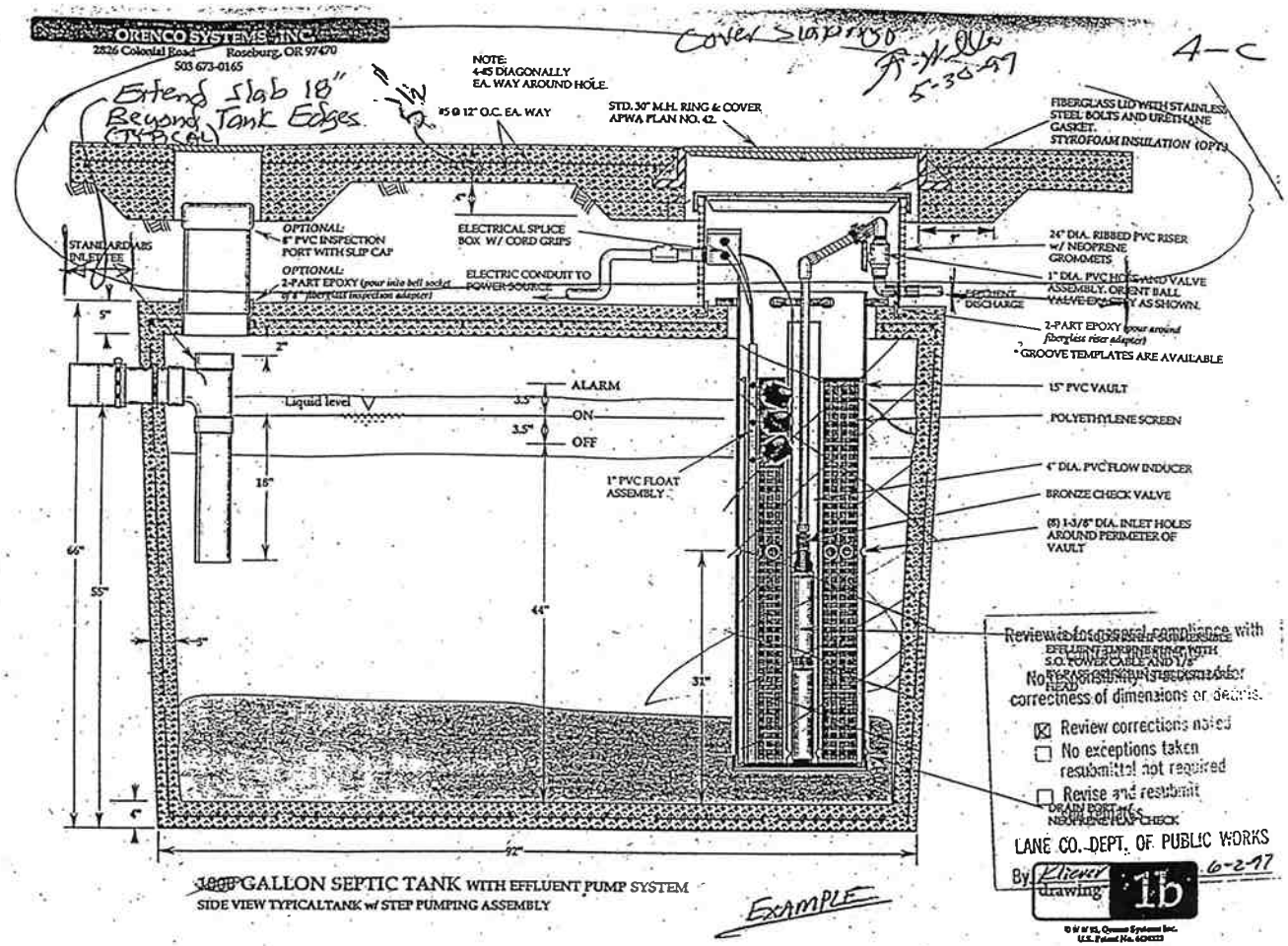
Tank Markings: Place marking on the upper most surface over the outlet.
Liquid capacity: 3000 gal.
Max burial depth: 4ft
Max traffic (wheel): 2500 lbs.
Date manufactured: _____
Permit no.: _____

Inc. 4-B
P.O. Box 7816
Eugene, OR
97401
Phone: 503-726-7666

Orenco Systems Inc.
814 Airway Avenue
Sutherlin, OR
97479-9012
Phone: 503-459-4445

Willamette Graystone Inc.
Eugene, OR
3000 Gallon Septic Tank

Approved By: TRB P.E.
Drawn By: CDV
Date: 6/23/95
Designed By: TRB P.E.
Drawing #: 1 of 4
Project #:

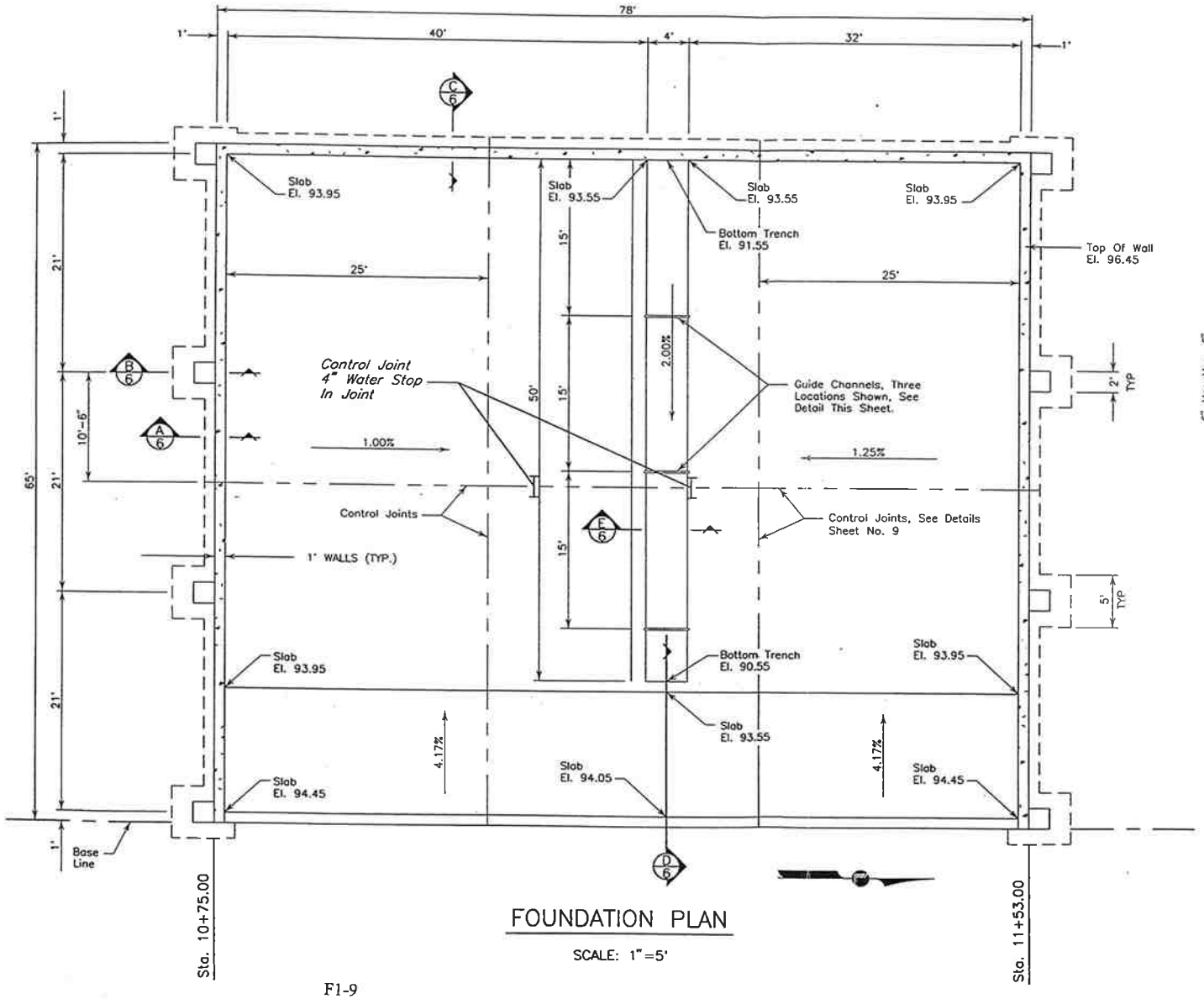

ORENCO SYSTEMS, INC.
2826 Colonial Road Roseburg, OR 97470
503 673-0165
Extend slab 18" Beyond Tank Edges (TYPICAL)
NOTE:
4-#5 DIAGONALLY
EA. WAY AROUND HOLE.
#5 @ 12" O.C. EA. WAY
STD. 30" M.H. RING & COVER
APWA PLAN NO. 42.
FIBERGLASS LID WITH STAINLESS STEEL BOLTS AND URETHANE GASKET. STYROFOAM INSULATION (OPT.)
STANDARD ABS INLET TEE
OPTIONAL: 8" PVC INSPECTION PORT WITH SLIP CAP
OPTIONAL: 2-PART EPOXY (pour into bell socket of 8" fiberglass inspection adapter)
ELECTRICAL SPLICE BOX W/ CORD GRIPS
ELECTRIC CONDUIT TO POWER SOURCE
24" DIA. RIBBED PVC RISER w/ NEOPRENE GROMMETS
1" DIA. PVC HOSE AND VALVE ASSEMBLY. ORIENT BALL VALVE EXACTLY AS SHOWN.
DISCHARGE
2-PART EPOXY (pour around fiberglass riser adapter)
* GROOVE TEMPLATES ARE AVAILABLE
15" PVC VAULT
POLYETHYLENE SCREEN
4" DIA. PVC FLOW INDUCER
BRONZE CHECK VALVE
(8) 1-3/8" DIA. INLET HOLES AROUND PERIMETER OF VAULT
ALARM
ON
OFF
Liquid level
1" PVC FLOAT ASSEMBLY
5"
2"
3.5"
3.5"
18"
66"
55"
44"
31"
5"
6"
72"
1000 GALLON SEPTIC TANK WITH EFFLUENT PUMP SYSTEM
SIDE VIEW TYPICAL TANK w/ STEP PUMPING ASSEMBLY
EXAMPLE
Cover Slab 1150 lbs
5-30-97
4-C
Review is for general compliance with
EFFLUENT TURBINE PUMP WITH
S.O. POWER CABLE AND 1/8"
HEAD
correctness of dimensions or details.
Review corrections noted
No exceptions taken
resubmittal not required
Revise and resubmit
DRAIN PORT w/
NEOPRENE FLAP CHECK
LANE CO. DEPT. OF PUBLIC WORKS
By Kliewer
drawing 1b
6-2-97

LANE COUNTY DEPARTMENT OF PUBLIC WORKS

VACTOR WASTE DISPOSAL FACILITY

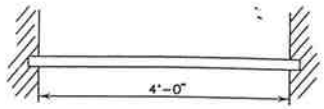
DATE	PROJECT NO.	ROAD NO.	SHEET NO.
March 1997	96806	M. – NA	5

"As Constructed Plans"

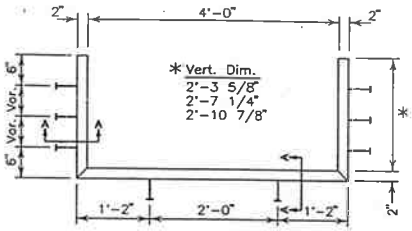


FOUNDATION PLAN

SCALE: 1"=5'

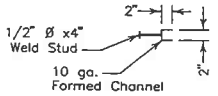


PLAN



ELEVATION

Note: Hot Dip Galvanize Assembly After Fabrictaion.



SECTION A–A

GUIDE CHANNEL

SCALE: 1"=1'-0"

GENERAL NOTES

All Material and workmanship shall conform to the Standard Specifications for Highway Construction, 1991 Edition, of the Oregon State Highway Division and the Special Provisions.

All concrete shall be class 3300 1–1/2" or 3/4", f'c=3300 psi.

All bars shall conform to ASTM Specification A615, Grade 60. All bars shall be lapped 2'–0" at splices. All bars shall be placed 2" clear of the nearest face of concrete unless noted or shown otherwise.

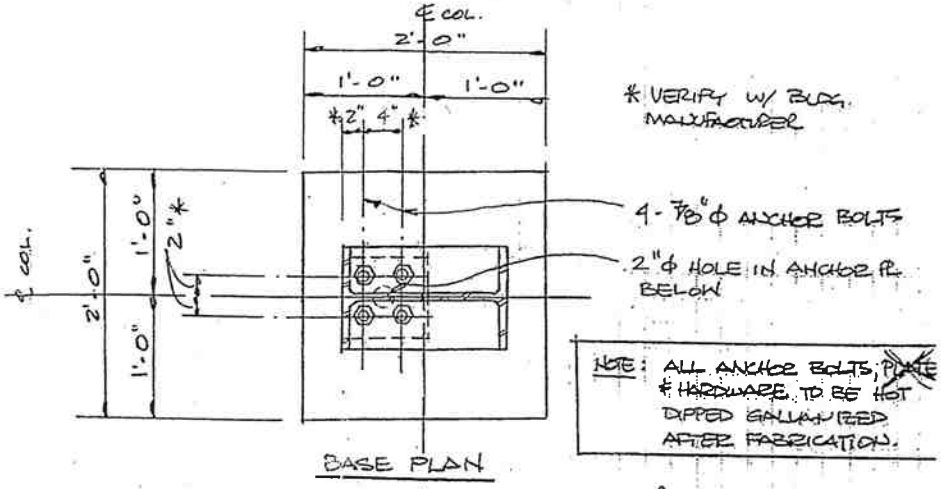
DETAIL.DWG

OBEC CONSULTING ENGINEERS

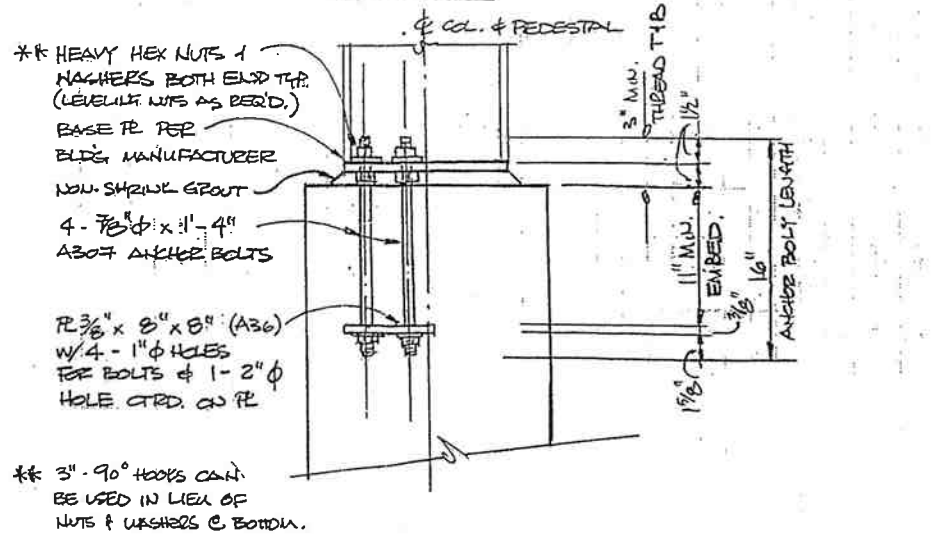
PROJECT VACOR WASTE FACILITY PROJ NO. 3-302 SHEET 9

CALCULATIONS BY JF DATE 6/15/93 CHK'D BY _____ DATE _____

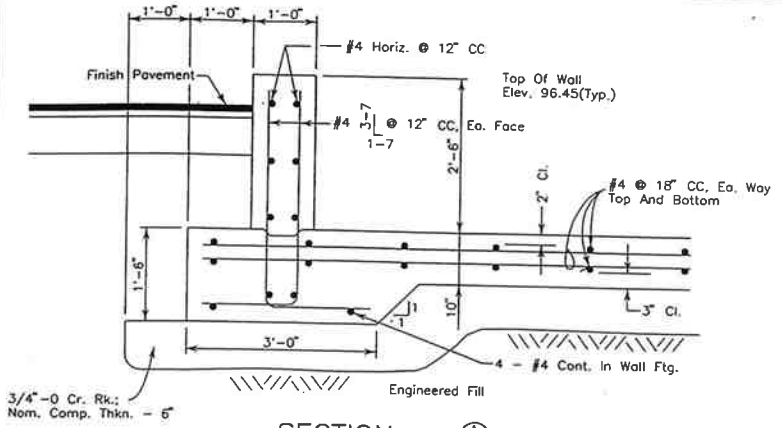
ANCHOR BOLT DETAIL @ COLUMN BASES



BASE PLAN

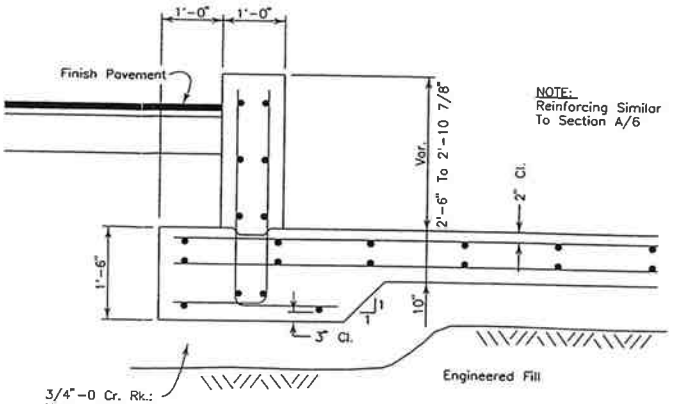


BASE ELEVATION



SECTION A/6

SCALE: 1"=1'-0"



SECTION C/6

SCALE: 1"=1'-0"

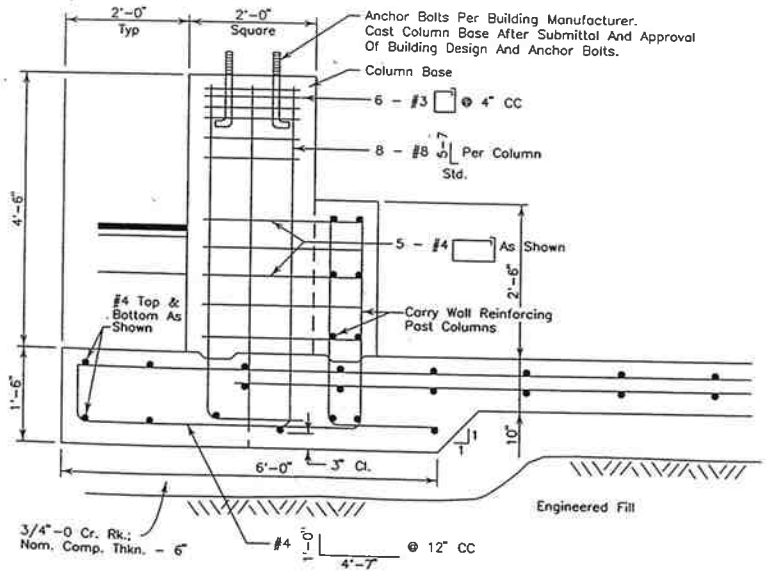
LANE COUNTY DEPARTMENT OF PUBLIC WORKS

VACTOR WASTE
DISPOSAL FACILITY

SHEET NO. 6

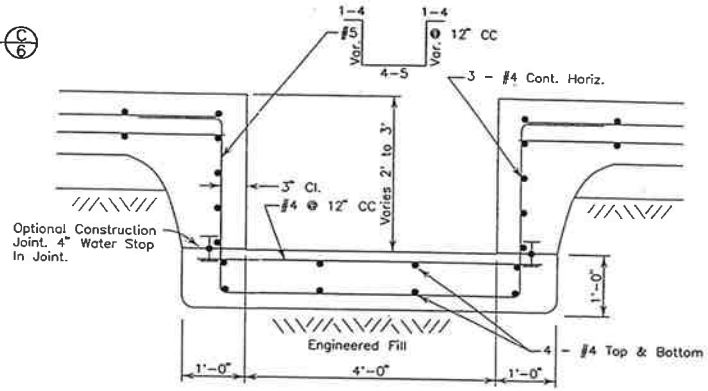
DATE	PROJECT NO.	ROAD NO.
March 1997	96806	M. - NA

"As Constructed Plans"



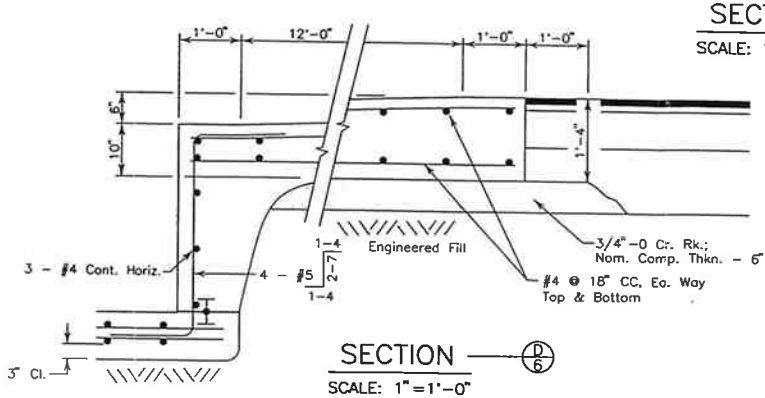
SECTION B/6

SCALE: 1"=1'-0"



SECTION E/6

SCALE: 1"=1'-0"



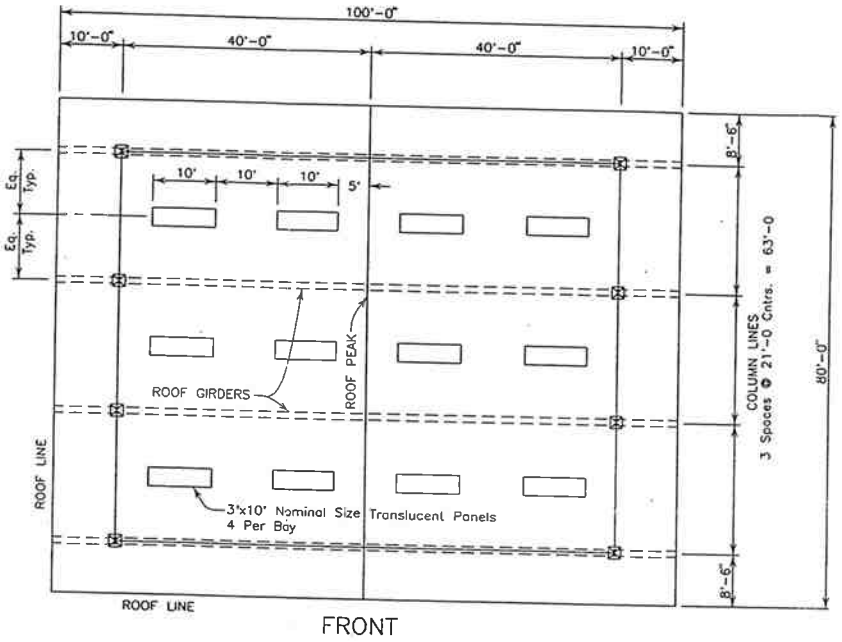
SECTION D/6

SCALE: 1"=1'-0"

DETAIL.DWG

LANE COUNTY DEPARTMENT OF PUBLIC WORKS
VACTOR WASTE DISPOSAL FACILITY
SHEET NO. 7
DATE: March 1997 | PROJECT NO.: 96806 | ROAD NO.: M. – NA

"As Constructed Plans"



FRONT

ROOF PLAN

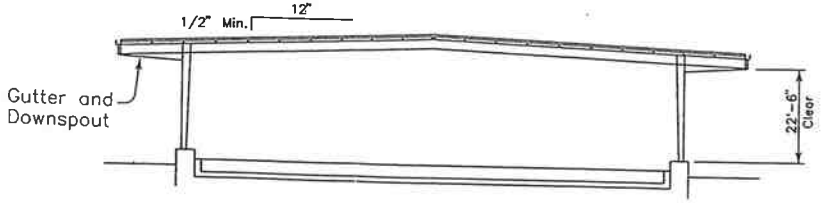
SCALE: 1"=10'

GENERAL NOTES

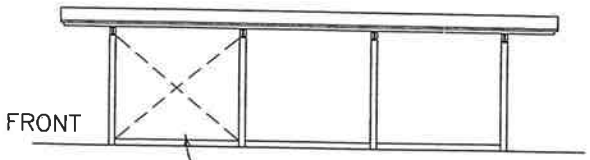
Building nominal size shown.

Structural design for the pre-engineered building to be provided by the contractor. Design must be stamped and signed by an Engineer registered in the State of Oregon.

The County has obtained the Building Permit to provide for construction of the site work and concrete work. The Contractor shall obtain the Building Permit for the steel building. Any changes required in the concrete foundation for the steel building supplied shall be at the Contractor's expense.



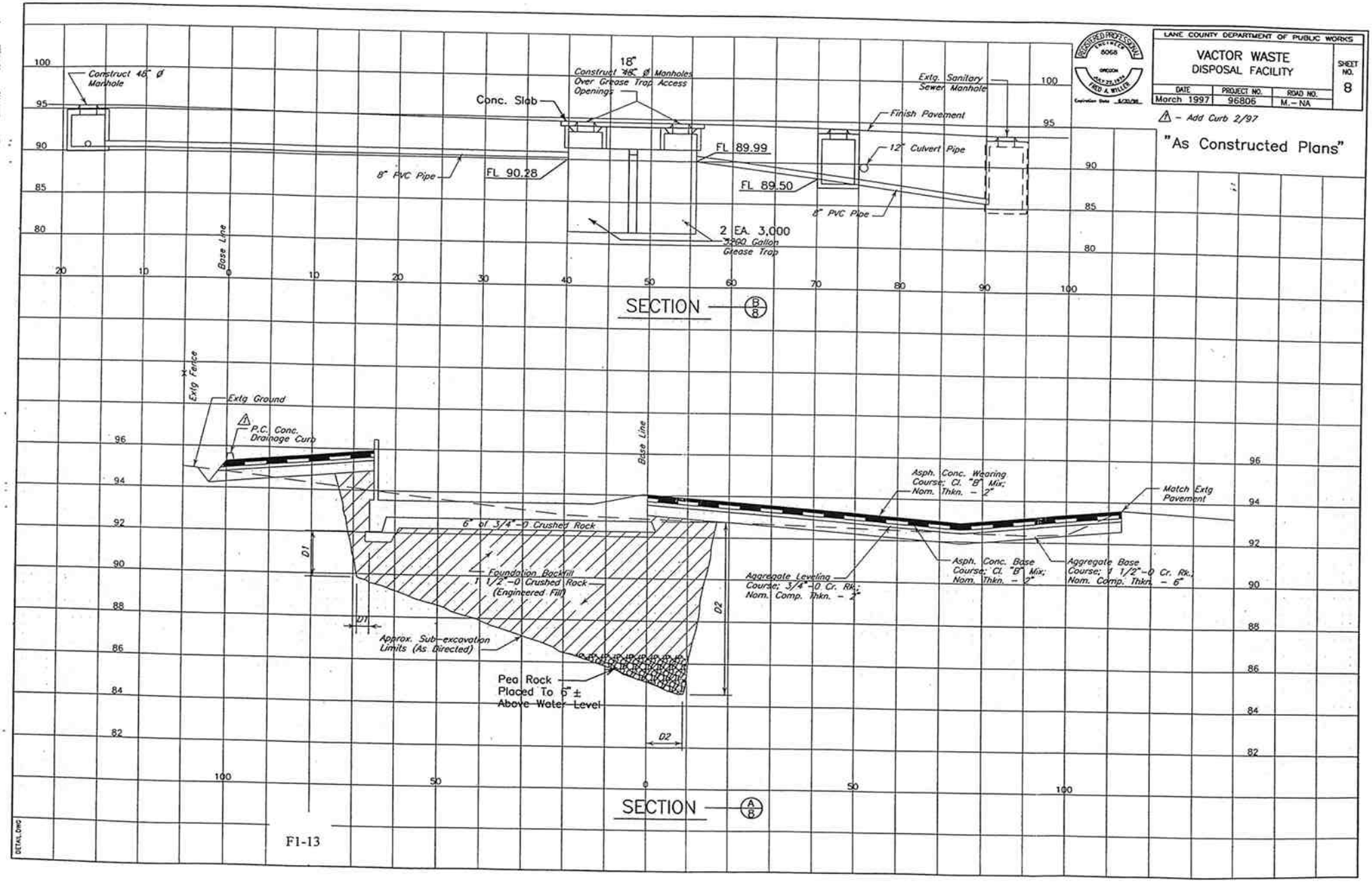
FRONT ELEVATION



SIDE ELEVATION

F1-12

DETAIL.DWG



REGISTERED PROFESSIONAL ENGINEER 8068 OREGON FRED A. WILLER

LANE COUNTY DEPARTMENT OF PUBLIC WORKS

VACTOR WASTE DISPOSAL FACILITY

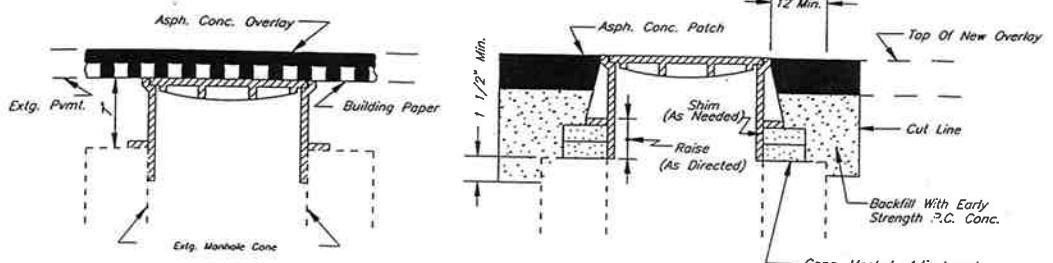
SHEET NO. 8

DATE	PROJECT NO.	ROAD NO.
March 1997	96806	M. - NA

⚠ - Add Curb 2/97

"As Constructed Plans"

"As Constructed Plans"



MANHOLE ADJUSTMENT CONSTRUCTION SEQUENCE

STEP 1. Cover Manhole With Building Paper And Const. Overlay Across Extg. Manholes.

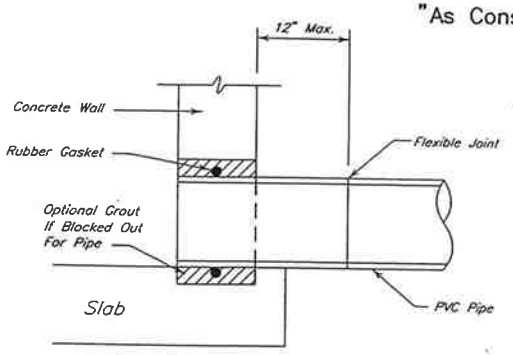
STEP 2. Cut Rectangular Excavation Around Manhole 12" Min. From M.H. Frame.

STEP 3. Raise Manhole Frame And Install Conc. Rings And Shim To Finish Pavement Profile And Cross Slope.

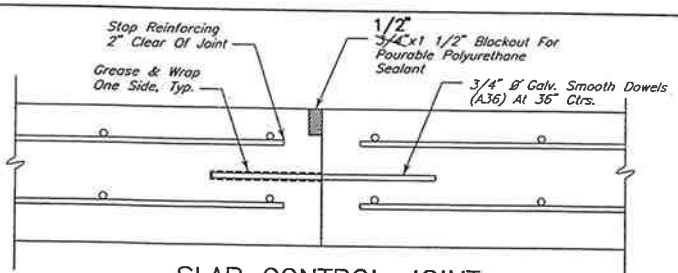
STEP 4. Backfill With Early Strength P.C. Conc. And Cl. "C" Asph. Conc. To Depths As Directed.

STEP 5. Seal Sawcuts With Polymerized Seal

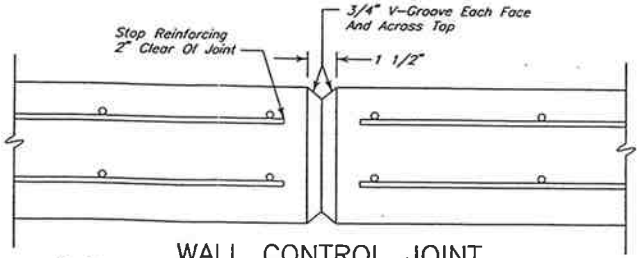
MANHOLE ADJUSTMENT DETAIL



PVC PIPE THRU WALL DETAIL

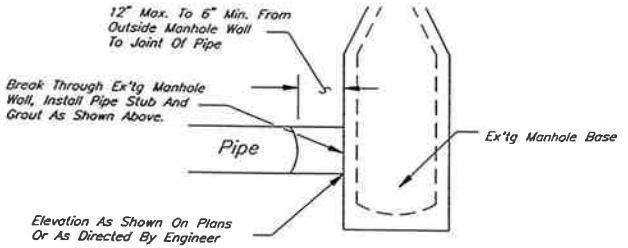


SLAB CONTROL JOINT



WALL CONTROL JOINT

F1-14

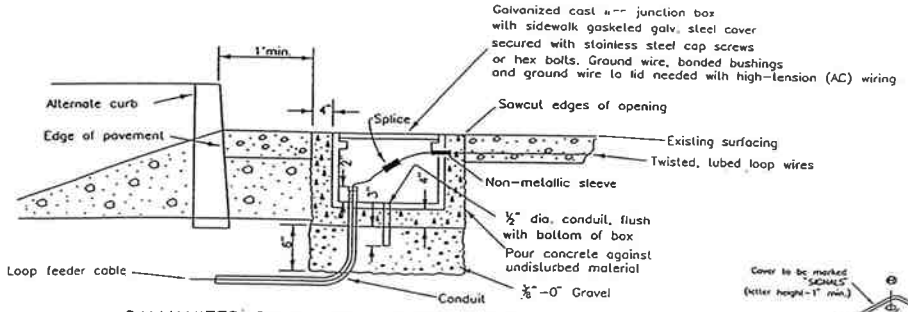


NOTE: KUT-N-KOR May Be Used As An Option

MANHOLE CUT-IN

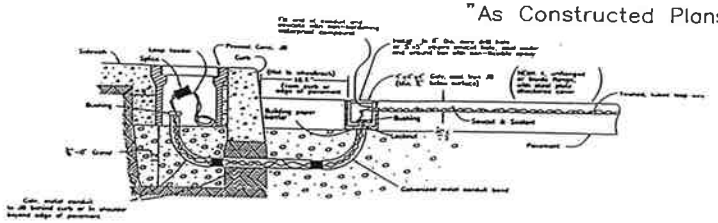
DETAIL.DWG

"As Constructed Plans"



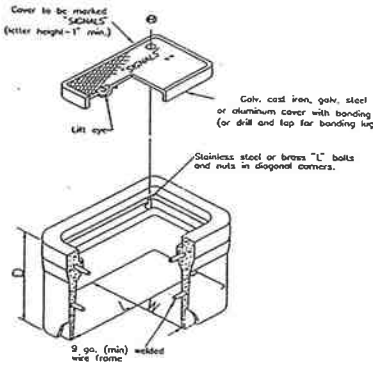
GALVANIZED CAST IRON JUNCTION BOX INSTALLATION IN PAVEMENT AND PAVED SHOULDER AREA

Locate junction box in accordance with Standard Specifications or as directed by the Engineer but not in wheel tracks. Where twisted loop wires enter side of junction box, file burrs from sawcut, sleeve each twisted pair of loop wires with a non-metallic sleeve extending a minium of 1" each side of the edge of the junction box. Fill conduit end and sawcut through box with a non-hardening waterproof compound.

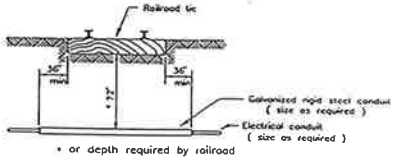


LOOP WIRE INSTALLATION AT CURB OR EDGE OF PAVEMENT
(Epoxy box installation is no longer acceptable)

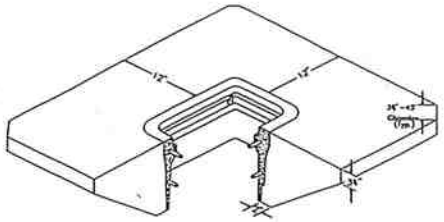
Note: Standard specifications 00960.41 (a) requires that all excavations in paved areas be cut to a depth of at least 2 inches with an approved pavement saw. An "Earth Saw", "Conduit Wheel ", etc., will not be approved. The backfill edges shall be sharp, well-defined with no evidence of cracking or stressing.



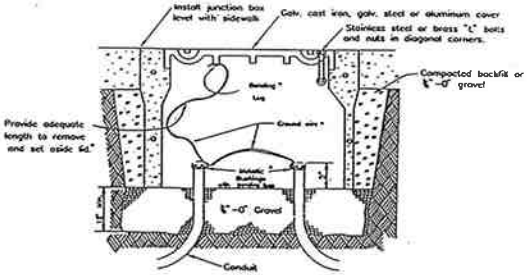
PRECAST CONCRETE JUNCTION BOX
Not to be used in travel lanes, shoulders or areas exposed to traffic.
For location and junction box dimensions, see plans.



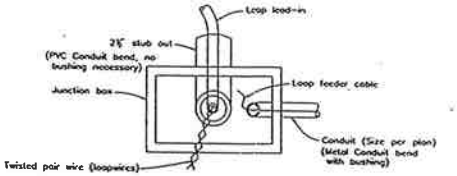
RAILROAD UNDERCROSSING DETAIL



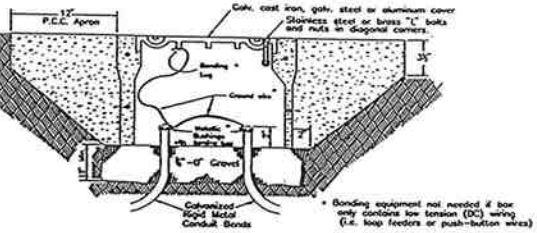
PRECAST CONCRETE JUNCTION BOX
WITH CONCRETE APRON
(Approx. 0.25 cu.yd. concrete in neat section)



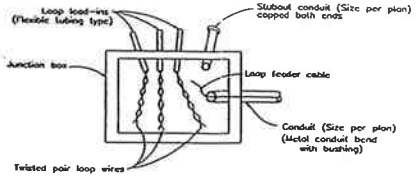
PRECAST CONCRETE JUNCTION BOX INSTALLATION
(In sidewalk, or at back of curb, or directly under guardrail)



OPTION "A"
Flexible loops



PRECAST CONCRETE JUNCTION BOX INSTALLATION
WITH 12" PORTLAND CEMENT CONCRETE APRON
(For incidental travel areas only; gravel shoulders, behind guardrail, etc)



OPTION "B"
Rigid loops

JUNCTION BOX INSTALLATIONS FOR
USE WITH PRE-FORMED LOOPS

JUNCTION BOX DIMENSION TABLE

CONCRETE BOX		GALV. CAST IRON, GALV. STEEL, OR ALUMINUM COVER						
TYPE	MIN. * THICKNESS	MIN. DEPTH BOX	** L	** W	R	EDGE THICKNESS	EDGE DEPTH
1	1"	12"	17-1/4"	10-1/4"	1-5/32"	1-5/32"	1/8"
2	1"	15"	22-1/4"	12-1/4"	1-1/16"	2"	1/8"
3	1-1/2"	12"	30"	17"	1-1/16"	2"	1/8"

* EXCLUDING CONDUIT WEB
** TOP DIMENSION

F1-15

LANE COUNTY
DEPT. OF PUBLIC WORKS
TRANSPORTATION ENGINEERING DIV.
3040 North Delta Highway
Eugene, Or. 97401 (503) 341-6900

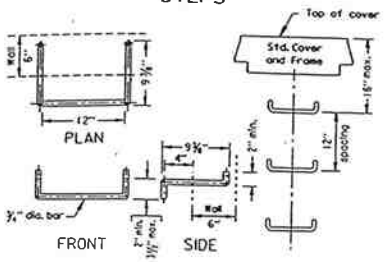
LTS-101
JUNCTION BOXES

PROJ #
SHEET # 10

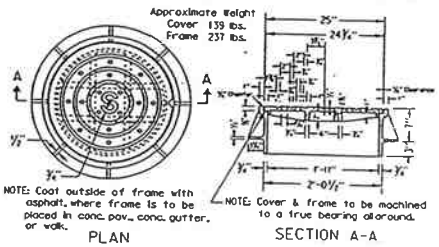
NO	REVISION	DATE	BY	APPR

DRAWN: JDMAC 6/90
DESIGNED:
CHECKED:
INTERSECTION:
REVISED: 7/95?

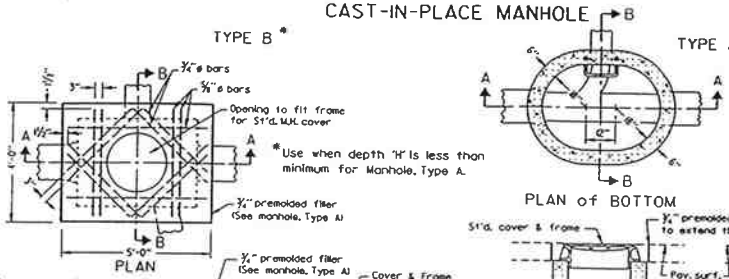
STEPS



STANDARD MANHOLE COVER & FRAME



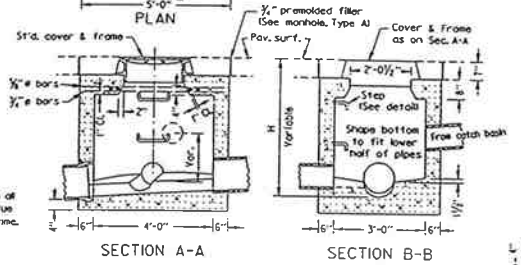
CAST-IN-PLACE MANHOLE

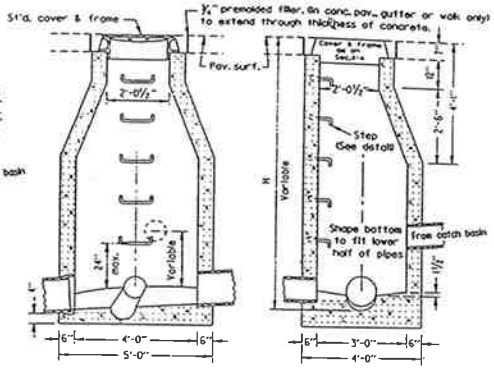


D@	H
8"	5'-0"
10"	5'-3"
12"	5'-6"
15"	5'-9"
18"	6'-0"
21"	6'-3"
24"	6'-6"
30"	7'-2"
36"	7'-8"

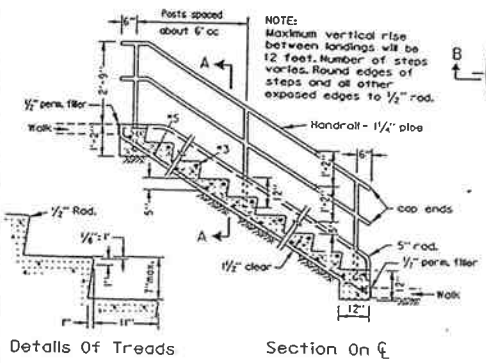
MINIMUM DEPTH 'H' FOR MANHOLE TYPE A

@ D is inside dia. of largest pipe entering or leaving at bottom of manhole.

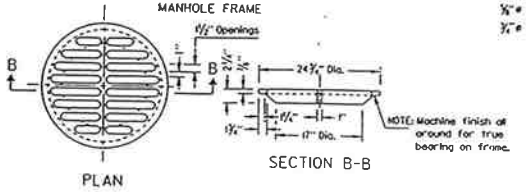




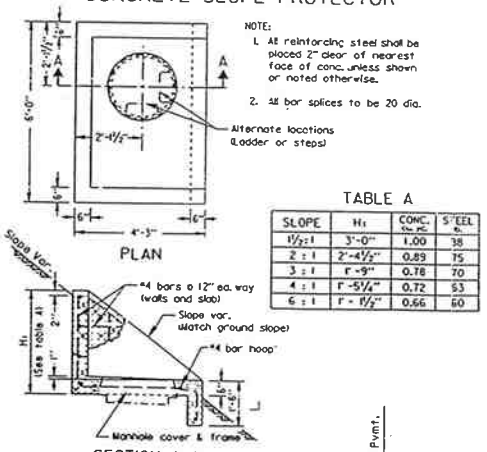
CONCRETE STAIRWAY



MANHOLE GRATE
FOR USE WITH STANDARD MANHOLE FRAME



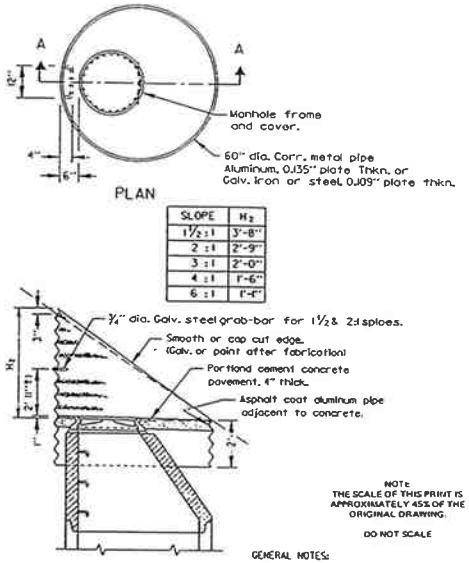
CONCRETE SLOPE PROTECTOR



SLOPE	H₁	CONC. cu. yd.	STEEL lbs.
1½:1	3'-0"	1.00	38
2 :1	2'-4½"	0.89	75
3 :1	1'-9"	0.78	70
4 :1	1'-5¼"	0.72	53
6 :1	1'-1½"	0.66	60

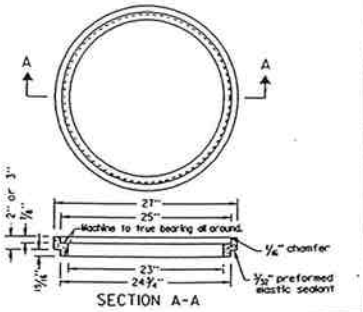
TABLE A

METAL PIPE SLOPE PROTECTOR

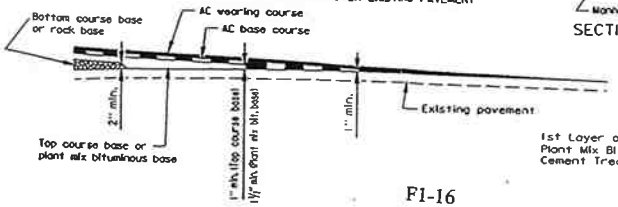


SLOPE	H₂
1½:1	3'-8"
2 :1	2'-9"
3 :1	2'-0"
4 :1	1'-6"
6 :1	1'-1"

MANHOLE ADJUSTMENT RINGS
(2 INCH OR 3 INCH INCREMENTS)

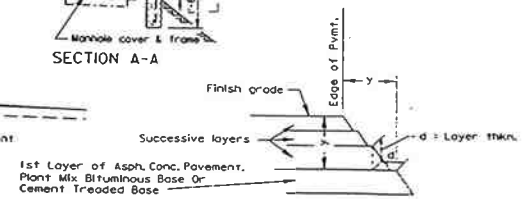


METHOD OF FEATHERING
NEW AC PAVEMENT OVER EXISTING PAVEMENT



F1-16

WIDENING FOR MULTI-LAYER PAVEMENT CONSTRUCTION



NOTE
THE SCALE OF THIS PRINT IS APPROXIMATELY 45% OF THE ORIGINAL DRAWING.
DO NOT SCALE

GENERAL NOTES:
1. For Precast Manhole see Drg. No. 2050A.

NOTE: All material and workmanship shall be in accordance with the current State of Oregon Standard Specifications for Highway Construction.

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY DIVISION
STANDARD

MISCELLANEOUS STRUCTURES
FOR URBAN PROJECTS

APRIL 1966

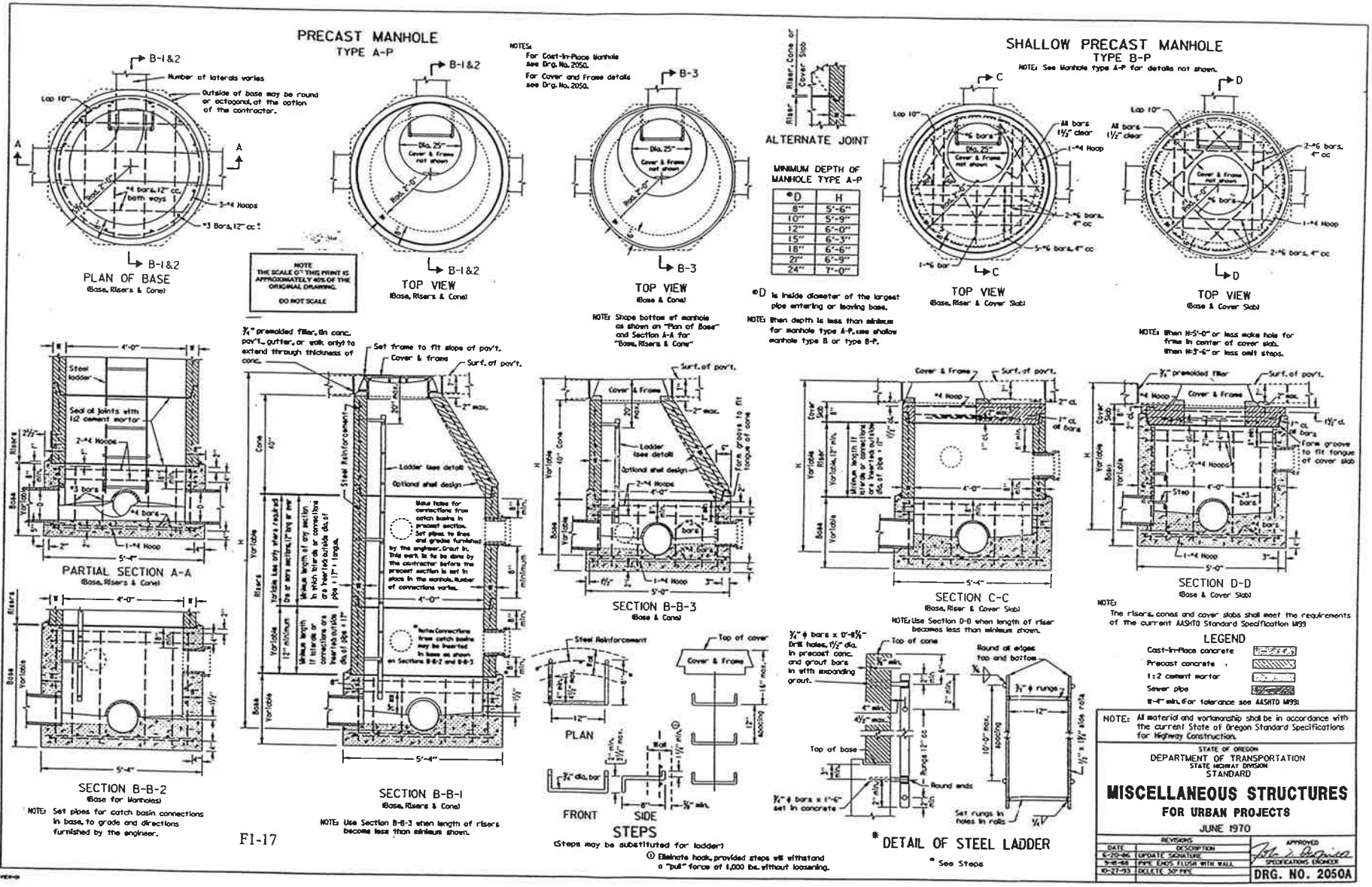
REVISIONS	
DATE	DESCRIPTION
NOV. 72	Added A.C. pavt. const. detail
MAY 75	Added metal pipe slope protector and manhole adjustment rings
SEPT. 80	PIPE ENDS FLUSH WITH WALL

APPROVED
Wayne F. Gibbons
HIGHWAY DESIGN ENGINEER

DRG. NO. 2050

SHEET 11

10-2-86
2-2.1



/usr/std/std/2050A.dgn 7-8-88

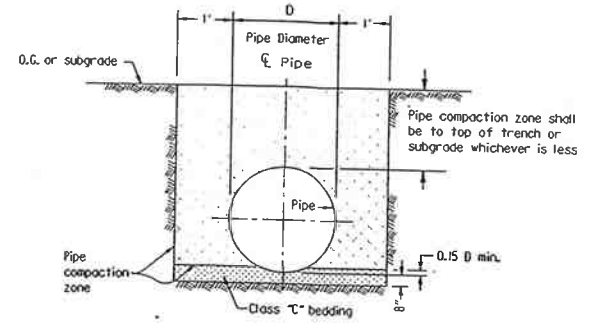
2-2.2

FI-17

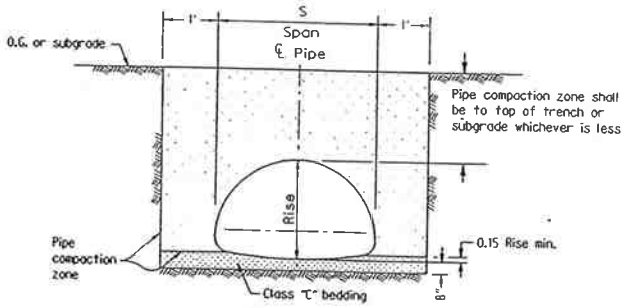
SHEET 12

PIPE BACKFILL / COMPACTION DETAILS

FOR PIPES WITH DIAMETERS LESS THAN 36"



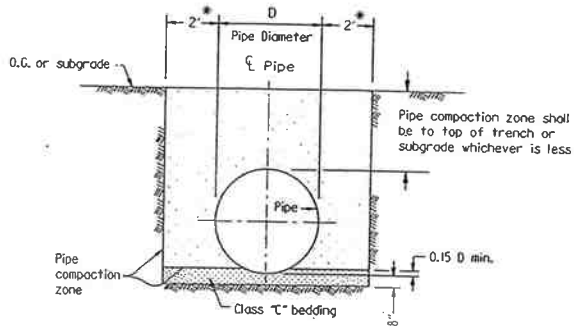
DETAIL "A"
For Circular Pipe



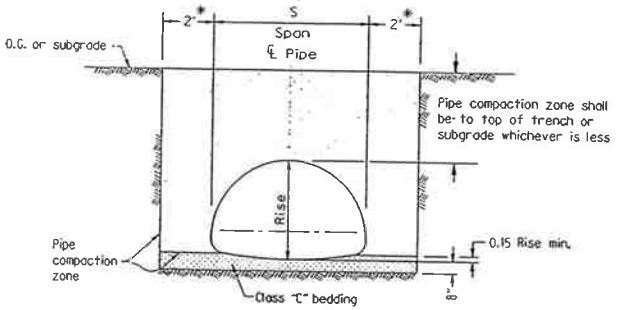
DETAIL " B"
For Pipe Arch

FOR PIPES WITH DIAMETERS BETWEEN 36" AND 72" INCLUSIVE

* Increase this dimension to D or S, as applicable, if pipe is placed in an embankment



DETAIL "C"
For Circular Pipe

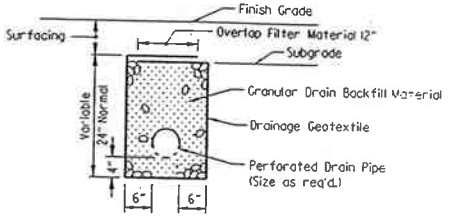


DETAIL " D"
For Pipe Arch

MULTIPLE INSTALLATIONS

Diameter	Min. Space Between Pipe
Up to 48"	24"
48" to 72"	One Half (1/2) Dia. of Pipe
72" to 180"	36"

SUBSURFACE DRAIN DETAIL



SECTION

General Notes

1. Construct foundation support for pipe(s) in poor soil conditions or when specified.
2. See bridge drawings for pipes with diameters greater than 72".
3. Bedding depths shall be measured from the widest outside diameter section for any given pipe.
4. Pipe compaction zone shall be one foot minimum above top of pipe in planted areas. Materials placed above pipe compaction zone shall be as shown in the plans.

Granular backfill material placed in 6" loose layers and compacted to 95% relative maximum density.

NOTE: All material and workmanship shall be in accordance with the current State of Oregon Standard Specifications for Highway Construction.

OREGON
DEPARTMENT OF TRANSPORTATION
STANDARD

PIPE BACKFILL/COMPACTION, MULTIPLE INSTALLATIONS & SUBSURFACE DRAIN

MAY, 1991

REVISIONS	
DATE	DESCRIPTION
9-93	REV. BEDDING DIMENSIONS
8-95	INCR. PIPE COMPACTION ZONE HEIGHT

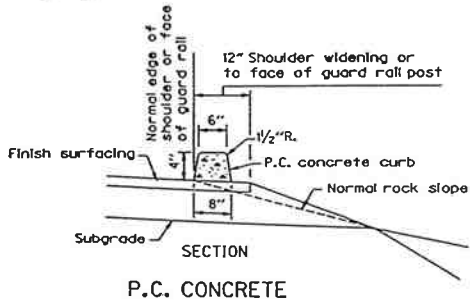
APPROVED
STANDARDS ENGINEER

DRG. NO. 2091A

01/2580or2091adgn 10-10-95

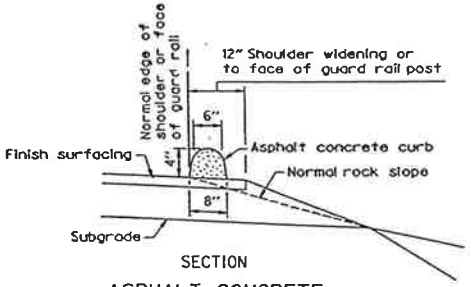
2-10.2

DRAINAGE CURBS



SECTION

P.C. CONCRETE

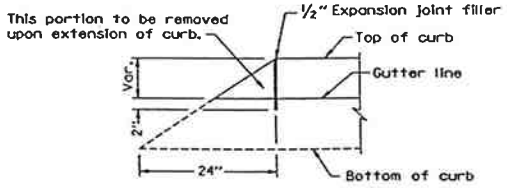


SECTION

ASPHALT CONCRETE

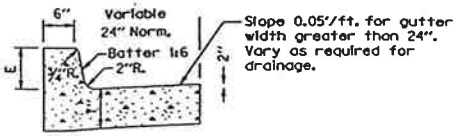
NOTE:

1. Dimensions nominal, vary to conform with curb machine approved by the engineer.
2. Joint Spacing. Expansion, 200' maximum and all points of tangency; contraction, 15' maximum.

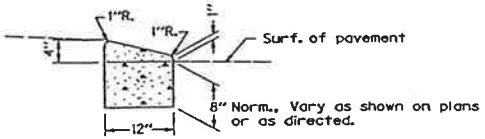


CURB ENDING DETAIL

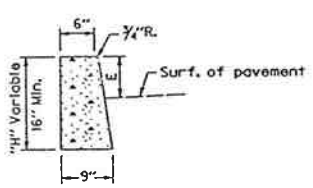
CURBS



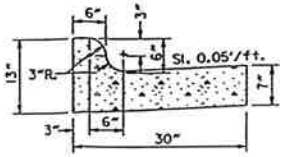
TYPE "A"



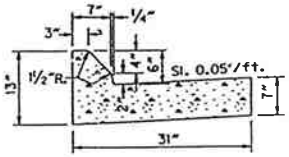
TYPE "B"
MOUNTABLE CURB



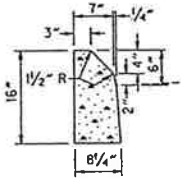
TYPE "C"



TYPE "D"
MOUNTABLE CURB



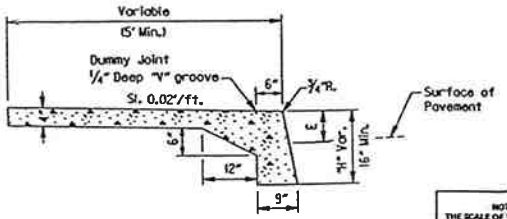
TYPE "E"
MOUNTABLE CURB



TYPE "F"
MOUNTABLE CURB

GENERAL NOTES:

1. Curb exposure "E" = 7" normal. Vary as shown on plans or as directed.
2. Joint spacing should be 15' maximum for contraction and 200' maximum or at all points of tangency for expansion.
3. Transitions shall be used in connecting curbs of different exposures "E". ("E" is the total vertical dimension of those curb surfaces having a slope of 1:1 or steeper.) Minimum desirable transition length shall be 20' for each 1" difference in "E".
4. Tops of all curbs shall slope toward the roadway 0.02' normal unless otherwise shown or as directed.



MONOLITHIC CURB & SIDEWALK

NOTE
THE SCALE OF THIS PRINT IS APPROXIMATELY 40% OF THE ORIGINAL DRAWING.
DO NOT SCALE

NOTE: All material and workmanship shall be in accordance with the current State of Oregon Standard Specifications for Highway Construction.

STATE OF OREGON
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY DIVISION
STANDARD

CURBS

JANUARY, 1983

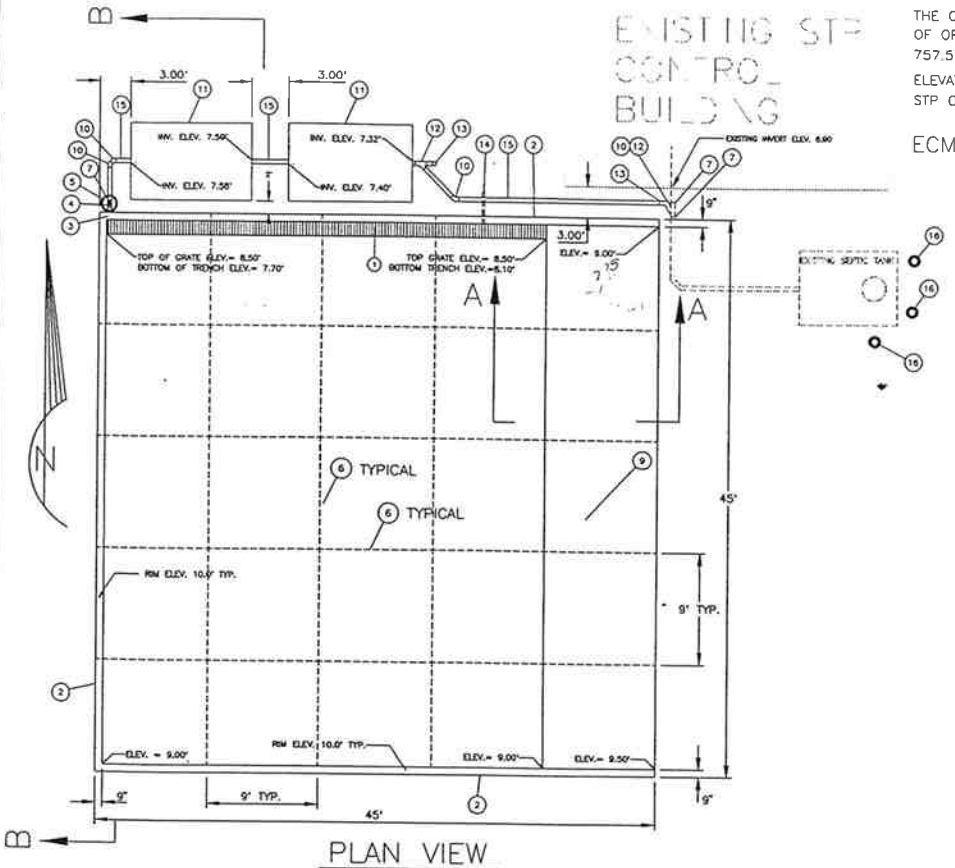
DATE	REVISIONS DESCRIPTION
DEC. 1983	ADD MONOLITHIC CURB & RAILS DETAIL
MAR. 1990	ADD TYPES B, E, & F CURBS
JULY, 1990	REV. DRAINAGE CURB DETAILS
MAY 1992	REV. DRAINAGE CURB HEIGHT TO 4"

APPROVED
SPECIFICATIONS ENGINEER

DRG. NO. 2077

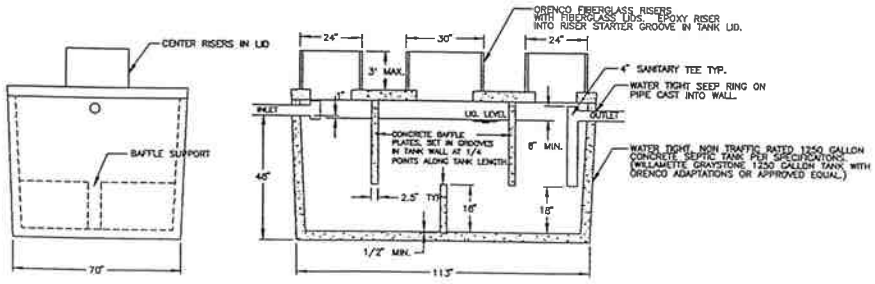
Z02X100.10412077.DGN1 5-1-92

2-4.1



PLAN VIEW

SCALE: 1"=10'

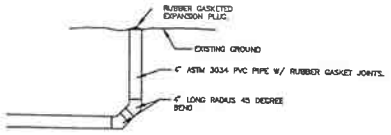


OIL WATER SEPARATOR DETAIL

SCALE 1"= 4'

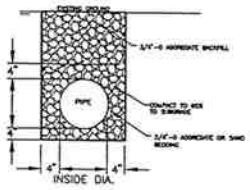
THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF OREGON UTILITY PROTECTION LAWS (ORS 757.541 TO 757.571) AND OTHER APPLICABLE EXCAVATION REGULATIONS. ELEVATION DATUM IS ASSUMED. INVERT ELEV. AT EXISTING STP CONTROL BUILDING SEWER = 6.90'

ECMS NO. 97-202 ACCNT. NO. 96-00012



CLEANOUT DETAIL

NOT TO SCALE



TRENCH DETAIL

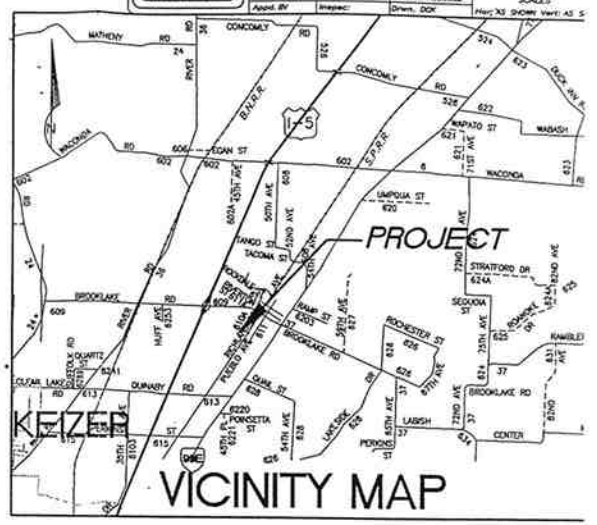
NOT TO SCALE

Marion County Dept. of Public Works
Engineering Tel. 588-5036 Salem, Oregon

1/2

VACTOR DUMP CONTAINMENT STRUCTURE AT BROOKS TREATMENT SITE

Des. DDF	Eng: DDF	Date: 4/3/96	Revised:
Reviewed By: -Survey: NA		Datum: ASSUMED	SCALES
Appd. BY	Inspec:	Drwn. DDF	Hor: AS SHOWN Vert: AS S



CONSTRUCTION NOTES:

1. CONSTRUCT CAST-IN-PLACE TRENCH DRAIN PER DETAIL ON SHEET 2.
2. PLACE NO. 5 REINFORCING BARS AS SHOWN IN REINFORCING DETAIL AT 8" O.C. EACH WAY IN ALL WALLS. THICKEN SLAB AS NECESSARY TO PROVIDE 4" MINIMUM CLEARANCE TO SAND BLANKET OR TRENCH DRAIN.
3. INSTALL 4" SCHEDULE 40 PVC PIPE AND FITTINGS AS REQUIRED.
4. INSTALL 4" 1/4 TURN PVC BALL VALVE WITH PIPE THREAD ENDS.
5. INSTALL 18" CONC. PIPE C1'4-3 W/ 3/4" STEEL PLATE LID.
6. PLACE 2 1/2" "ZIP STRIP" CRACK CONTROL STRIPS.
7. INSTALL 4" COULTER COUPLER
8. NOT USED
9. CONSTRUCT 9" THICK SLAB OF MINOR STRUCTURE CONCRETE.
10. INSTALL 4" PVC LONG RADIUS 45 DEGREE BEND W/ RUBBER GASKET JOINTS.
11. INSTALL OIL WATER SEPARATOR PER DETAIL ON THIS SHEET.
12. INSTALL 4" PVC WYE W/ RUBBER GASKET JOINTS, ASTM 3034
13. INSTALL 4" CLEANOUT PER DETAIL ON THIS SHEET.
14. INSTALL 3" SCHEDULE 40 PVC PIPE STUB WITH CAP, STUB INTO TRENCH DRAIN.
15. INSTALL 4" ASTM 3034 PVC PIPE W/ RUBBER GASKETS, SLOPE UNIFORMLY AT 2% MINIMUM.
16. CONSTRUCT BOLLARD PER DETAIL ON THIS SHEET.

Marion County Dept. of Public Works
Engineering Tel. 588-5034 Salem, Oregon

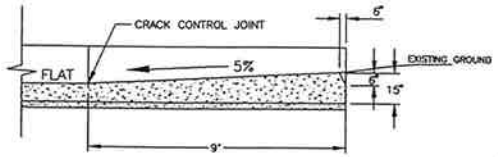
2/2

VACTOR DUMP CONTAINMENT STRUCTURE AT BROOKS TREATMENT SITE

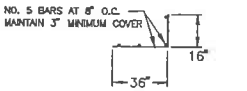
Des. DCK	Eng: GS	Date: 3/5/94	Revised:
Reviewed By: --Survey: NA		Datum: ASSUMED	SCALES
Appd. DCK	Inspect:	Drwn. DCK	Horiz: AS SHOWN Vert: AS SHOWN

CONSTRUCTION NOTES:

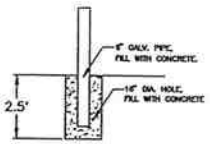
1. CAST-IN-PLACE TRENCH DRAIN PER DETAIL ON THIS SHEET.
2. PLACE NO. 5 REINFORCING BARS AS SHOWN IN REINFORCING DETAIL AT 8" O.C. EACH WAY IN ALL WALLS. THICKEN SLAB AS NECESSARY TO PROVIDE 4" MINIMUM CLEARANCE TO SAND BLANKET OR TRENCH DRAIN.
3. CONSTRUCT 3" THICK SAND BEDDING PER SECTION 00360 OF THE STANDARD SPECIFICATIONS.
4. PLACE SEAMLESS 6 MIL BLACK POLYETHYLENE SHEETING UNDER SAND BASE, EXTEND TO GROUND SURFACE.
5. CONSTRUCT 9" THICK SLAB OF MINOR STRUCTURE CONCRETE.
6. PLACE 2 1/2" "ZIP STRIP" CRACK CONTROL STRIPS.



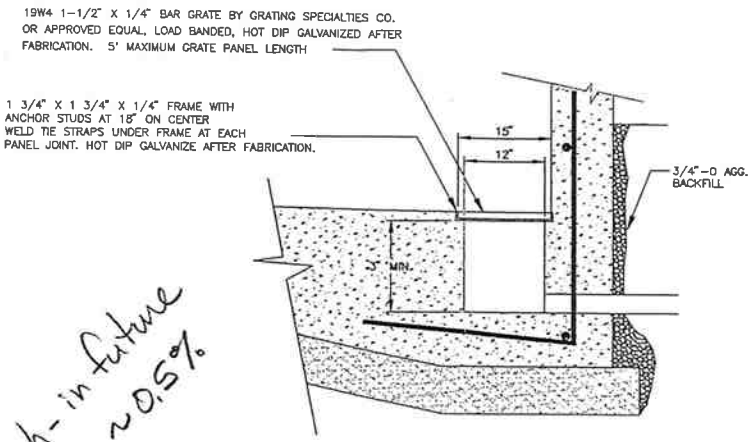
SECTION A-A
NOT TO SCALE



REINFORCING DETAIL
NOT TO SCALE

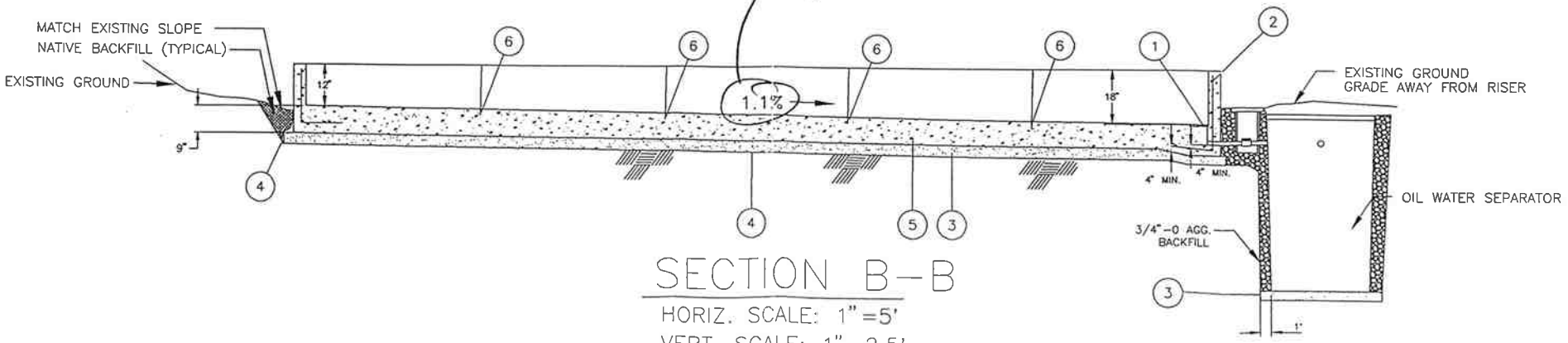


BOLLARD DETAIL
NOT TO SCALE

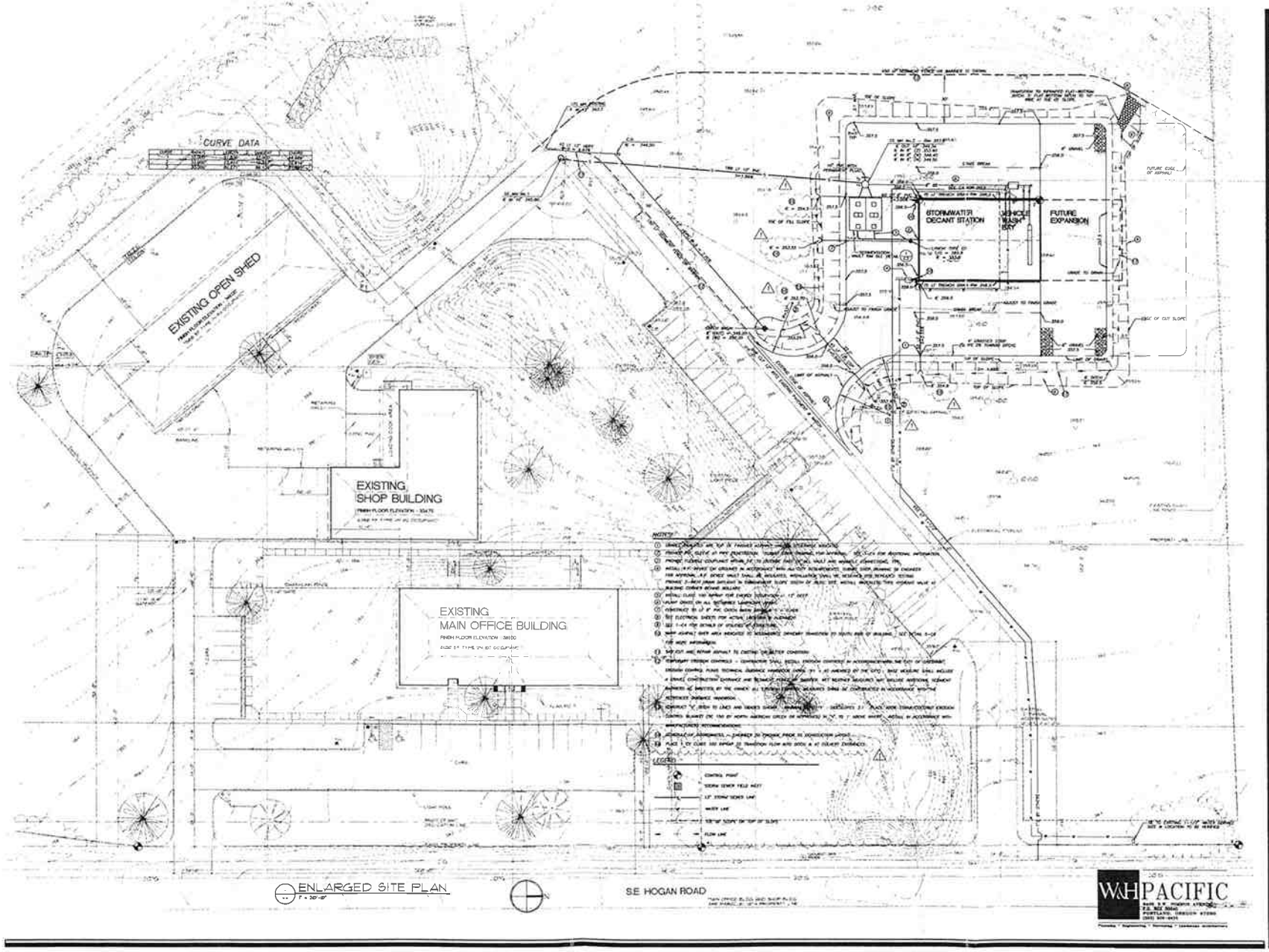


TRENCH DRAIN DETAIL
NOT TO SCALE

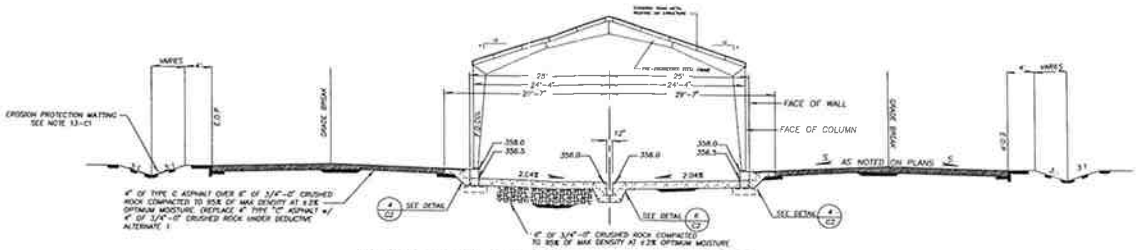
to much- in future reduce to ~0.5%



SECTION B-B
HORIZ. SCALE: 1"=5'
VERT. SCALE: 1"=2.5'

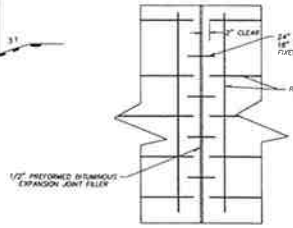

CURVE DATA
EXISTING OPEN SHED
EXISTING
SHOP BUILDING
EXISTING
MAIN OFFICE BUILDING
STORMWATER
DECANT STATION
VEHICLE
WASH
BAY
FUTURE
EXPANSION
FUTURE EDGE OF ASPHALT
EDGE OF CUT SLOPE
S.E. HOGAN ROAD
ENLARGED SITE PLAN
SITE & GRADING PLAN
CITY OF GRESHAM
DEPARTMENT OF ENVIRONMENTAL SERVICES
OPERATIONS CENTER
STORMWATER DECANT STATION/ VEHICLE WASH
W&H PACIFIC
C1

F3-1



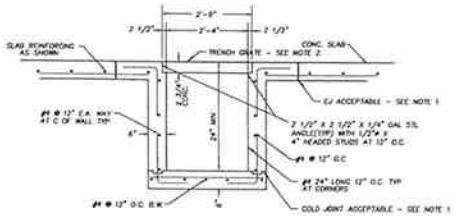
SECTION SHED BUILDING 1 C2

NOT TO SCALE



EXPANSION JOINT 9 C2

N.T.S.

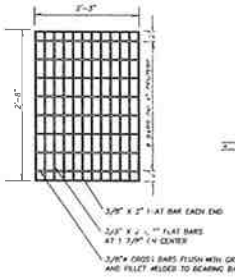


TRENCH SECTION (WASH BAY) 2 C2

N.T.S.

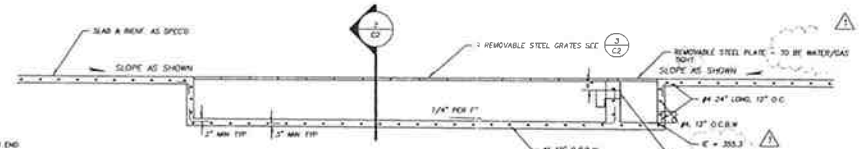
NOTES:

1. CONTRACTOR SHALL SUBMIT PROPOSED JOINT LAYOUT FOR ENGINEER APPROVAL PRIOR TO CONSTRUCTION
2. CONTRACTOR SHALL SUBMIT PROPOSED TRENCH GRATE DETAILS PRIOR TO FABRICATION.



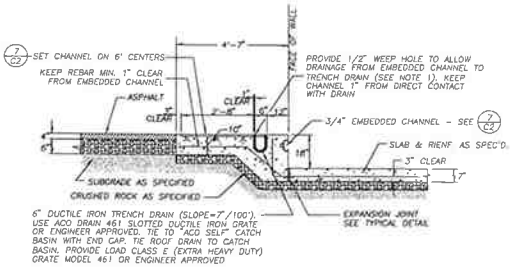
TRENCH GRATE DETAIL (WASH BAY) 3 C2

N.T.S.



TRENCH SECTION (WASH BAY) 8 C2

N.T.S

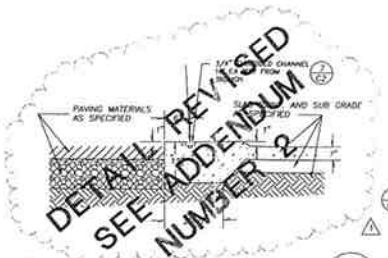


TRENCH DRAIN "DROP-OFF" 4 C2

N.T.S

NOTE:

1. CONTRACTOR TO PROVIDE OWNER WITH TRENCH DRAIN SHOVEL HEAD

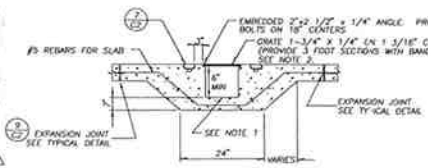


THICKENED EDGE SECTION 5 C2

N.T.S.

NOTE:

1. INTERIOR GRADE BEAMS SIMILAR, CENTER CMU WALLS ON BEAM WHERE SHOWN.

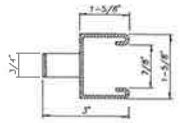


DRAINAGE TROUGH 6 C2

N.T.S

NOTES:

1. GROUT INVERT FOR SLOPE INDICATED.
2. CONTRACTOR SHALL SUBMIT PROPOSED TRENCH GRATE DETAIL PRIOR TO FABRICATON



USE GLOBE STRUT SERIES CL-58 OR EQUAL

EMBEDDED CHANNEL (TYP) 7 C2

SCALE: NTS

NOTE:

THE EMBEDDED CHANNELS ARE INSTALLED FOR THE FUTURE USE OF FIXING FLASH BOARDS, WHEEL STOPS, ETC. CONTRACTOR TO FURNISH OWNER WITH A CATALOG OF FITTINGS AVAILABLE FOR THE PARTICULAR CHANNEL USED.

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FOUNDATION DETAILS
CITY OF GRESHAM
DEPARTMENT OF ENVIRONMENTAL SERVICES
OPERATIONS CENTER
CONSOLIDATED REPAINT STATION/VEHICLE WASH FACILITY

APPROVED CITY OF GRESHAM

DATE

C2

F3-2

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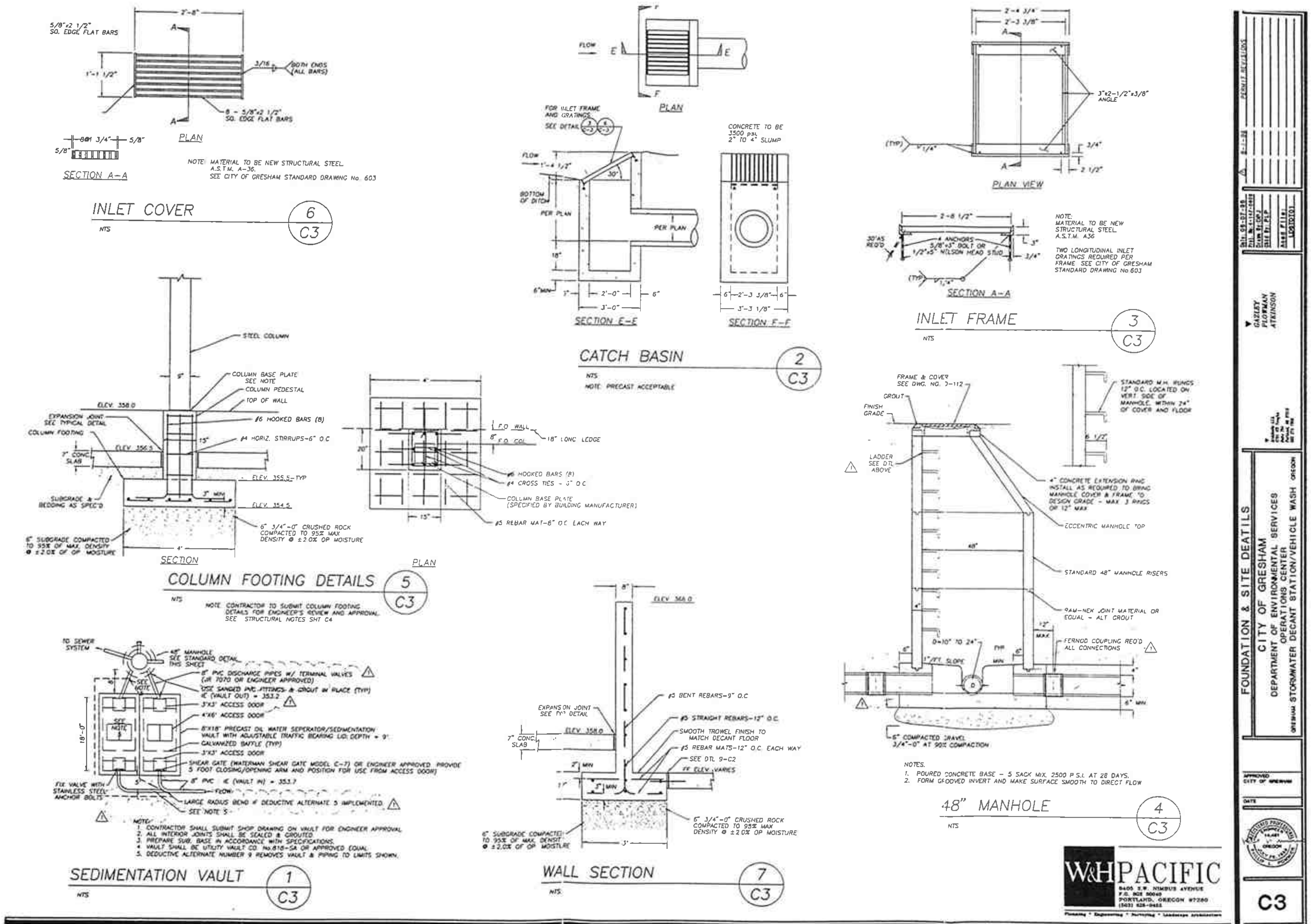
INLET COVER 6 C3
NTS
PLAN
SECTION A–A
5/8"x2 1/2" SQ. EDGE FLAT BARS
8 – 5/8"x2 1/2" SQ. EDGE FLAT BARS
BOTH ENDS (ALL BARS)
NOTE: MATERIAL TO BE NEW STRUCTURAL STEEL A.S.T.M. A-36. SEE CITY OF GRESHAM STANDARD DRAWING No. 603
CATCH BASIN 2 C3
NTS
NOTE: PRECAST ACCEPTABLE
FLOW
PLAN
FOR INLET FRAME AND GRATINGS SEE DETAIL
BOTTOM OF DITCH
PER PLAN
CONCRETE TO BE 3500 psi 2" TO 4" SLUMP
SECTION E–E
SECTION F–F
INLET FRAME 3 C3
NTS
PLAN VIEW
SECTION A–A
3"x2-1/2"x3/8" ANGLE
4 ANCHORS 5/8"x3" BOLT OR 1/2"x5" NELSON HEAD STUD
NOTE: MATERIAL TO BE NEW STRUCTURAL STEEL A.S.T.M. A36
TWO LONGITUDINAL INLET GRATINGS REQUIRED PER FRAME. SEE CITY OF GRESHAM STANDARD DRAWING No 603
COLUMN FOOTING DETAILS 5 C3
NTS
NOTE: CONTRACTOR TO SUBMIT COLUMN FOOTING DETAILS FOR ENGINEER'S REVIEW AND APPROVAL. SEE STRUCTURAL NOTES SHT C4
SECTION
PLAN
STEEL COLUMN
COLUMN BASE PLATE SEE NOTE
COLUMN PEDESTAL
TOP OF WALL
#6 HOOKED BARS (8)
#4 HORIZ. STIRRUPS–6" O.C
ELEV. 358.0
EXPANSION JOINT SEE TYPICAL DETAIL
COLUMN FOOTING
ELEV. 356.5
7" CONC. SLAB
ELEV. 355.5–TYP
ELEV. 354.5
SUBGRADE & BEDDING AS SPEC'D
6" 3/4"–0" CRUSHED ROCK COMPACTED TO 95% MAX DENSITY @ ±2.0% OP MOISTURE
6" SUBGRADE COMPACTED TO 95% OF MAX. DENSITY @ ±2.0% OF OP MOISTURE
F.O. WALL
F.O. COL
18" LONG LEDGE
#6 HOOKED BARS (8)
#4 CROSS TIES – 3" O.C
COLUMN BASE PLATE (SPECIFIED BY BUILDING MANUFACTURER)
#5 REBAR MAT–6" O.C EACH WAY
48" MANHOLE 4 C3
NTS
FRAME & COVER SEE DWG. NO. 3–112
GROUT
FINISH GRADE
LADDER SEE DTL ABOVE
STANDARD M.H. RUNGS 12" O.C. LOCATED ON VERT. SIDE OF MANHOLE, WITHIN 24" OF COVER AND FLOOR
4" CONCRETE EXTENSION RING INSTALL AS REQUIRED TO BRING MANHOLE COVER & FRAME TO DESIGN GRADE – MAX 3 RINGS OR 12" MAX
ECCENTRIC MANHOLE TOP
STANDARD 48" MANHOLE RISERS
RAM–NEK JOINT MATERIAL OR EQUAL – ALT GROUT
FERNCO COUPLING REQ'D ALL CONNECTIONS
0–10" TO 24"
1"/FT. SLOPE
6" COMPACTED GRAVEL 3/4"–0" AT 90% COMPACTION
NOTES.
1. POURED CONCRETE BASE – 5 SACK MIX, 2500 P.S.I. AT 28 DAYS.
2. FORM GROOVED INVERT AND MAKE SURFACE SMOOTH TO DIRECT FLOW
SEDIMENTATION VAULT 1 C3
NTS
TO SEWER SYSTEM
48" MANHOLE SEE STANDARD DETAIL THIS SHEET
8" PVC DISCHARGE PIPES W/ TERMINAL VALVES (JR 7070 OR ENGINEER APPROVED)
USE SANDED PVC FITTINGS & GROUT IN PLACE (TYP)
IE (VAULT OUT) = 353.2
3'X3' ACCESS DOOR
4'X6' ACCESS DOOR
8'X18' PRECAST OIL WATER SEPERATOR/SEDIMENTATION VAULT WITH ADJUSTABLE TRAFFIC BEARING LID, DEPTH = 9'
GALVANIZED BAFFLE (TYP)
3'X3' ACCESS DOOR
SHEAR GATE (WATERMAN SHEAR GATE MODEL C-7) OR ENGINEER APPROVED. PROVIDE 5 FOOT CLOSING/OPENING ARM AND POSITION FOR USE FROM ACCESS DOOR
8" PVC IE (VAULT IN) = 353.7
FLOW
LARGE RADIUS BEND # DEDUCTIVE ALTERNATE 5 IMPLEMENTED
SEE NOTE 5
FIX VALVE WITH STAINLESS STEEL ANCHOR BOLTS
18'-0"
NOTES:
1. CONTRACTOR SHALL SUBMIT SHOP DRAWING ON VAULT FOR ENGINEER APPROVAL.
2. ALL INTERIOR JOINTS SHALL BE SEALED & GROUTED.
3. PREPARE SUB. BASE IN ACCORDANCE WITH SPECIFICATIONS.
4. VAULT SHALL BE UTILITY VAULT CO. No.818-SA OR APPROVED EQUAL.
5. DEDUCTIVE ALTERNATE NUMBER 9 REMOVES VAULT & PIPING TO LIMITS SHOWN.
WALL SECTION 7 C3
NTS
ELEV. 364.0
#5 BENT REBARS–9" O.C
#5 STRAIGHT REBARS–12" O.C.
SMOOTH TROWEL FINISH TO MATCH DECANT FLOOR
#5 REBAR MATS–12" O.C. EACH WAY
SEE DTL 9–C2
FF ELEV. VARIES
EXPANSION JOINT SEE "Y" DETAIL
7" CONC. SLAB
ELEV. 358.0
6" 3/4"–0" CRUSHED ROCK COMPACTED TO 95% MAX DENSITY @ ±2.0% OP MOISTURE
6" SUBGRADE COMPACTED TO 95% OF MAX. DENSITY @ ±2.0% OF OP MOISTURE
FOUNDATION & SITE DETAILS
CITY OF GRESHAM
DEPARTMENT OF ENVIRONMENTAL SERVICES
OPERATIONS CENTER
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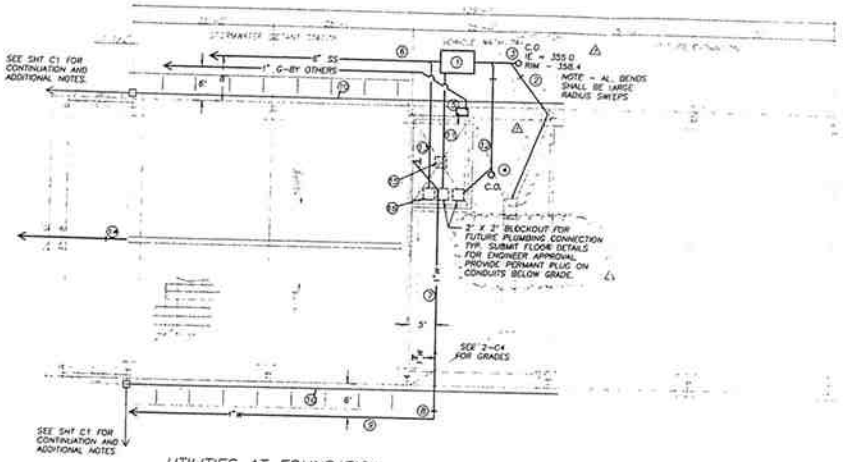
F3-3

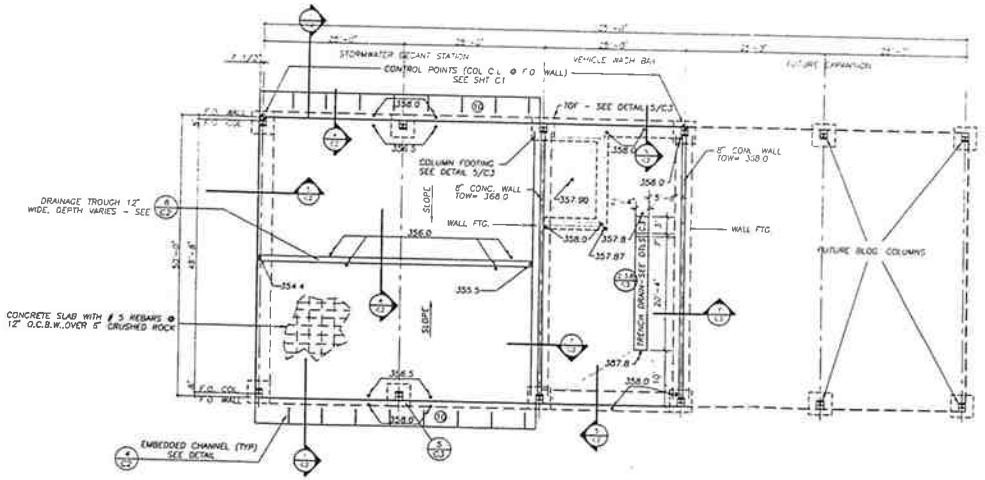


UTILITIES AT FOUNDATION

SCALE: 1"/8'-1'-0"

1 C4

NOTE: EQUIPMENT ROOM PLUMBING IS FOR FUTURE WASH WATER RECYCLING SYSTEM & PRESSURE WASHER NO PERMANENTLY INSTALLED VEHICLE WASH EQUIPMENT WILL BE PROVIDED AT THIS TIME △



FOUNDATION PLAN

SCALE: 1"/8'-1'-0"

2 C4

CONSTRUCTION NOTES:

1. CONSTRUCT OIL/WATER SEPARATOR, 660-SA BY UTILITY VAULT OR ENGINEER APPROVED. INSTALL NEMA WATER TIGHT JUNCTION BOX AND CONDUCTOR - SEE ELECTRICAL SHEETS FOR MORE INFORMATION. COORDINATE INVERT ELEVATIONS & ALL PENETRATIONS (SIZE, LOCATION, ELEVATION) WITH WASH EQUIP. MANUFACTURER.
2. PROVIDE TRANSITION COUPLING - 6" PVC TO 6" DIP
3. INSTALL 10 LF 6" PVC AND CLEANOUT TO INDICATED GRADES △
4. INSTALL 25 LF 6" DIP TO INDICATED GRADES.
5. GAS METER. CONTRACTOR SHALL COORDINATE PLACEMENT AND INSTALLATION OF GAS SERVICE BY GAS UTILITY. CONTRACTOR SHALL STUB AND CAP 1" GAS SERVICE THROUGH WALL 6" INTO EQUIPMENT ROOM. NOT IN CONTRACT IF DEDUCTIVE ALTERNATE TWO (2) IS IMPLEMENTED.
6. INSTALL 94 LF 6" PVC SANITARY SEWER PIPE TO INDICATED GRADES.
7. INSTALL 8 LF 1 1/2" COPPER WATER SERVICE AND 44 LF TOTAL OF 1" COPPER WATER SERVICE WITH TWO (2) FREEZE PROOF HYDRANTS AT LOCATIONS SHOWN (MOF 38, BY MOST DEPENDABLE FOUNTAINS OF MEMPHIS TENN., EQUIPED WITH HOSE HOOKS, 1" ANTI-SIPHON, SELF DRAINING FROST PROOF SILL-COCK, AND TRAFFIC BEARING, BELOW GROUND VALVE BOX WITH COVER.) MOUNT PERMANENT SIGNS ABOVE HYDRANTS "DANGER-UNSAFE WATER". PROVIDE CAUTION TAPE ABOVE WATER LINE IN TRENCH "NONPOTABLE WATER". △
8. PROVIDE TRANSITION COUPLING - 1 1/2" PVC TO 1 1/2" COPPER
9. INSTALL 65 LF 1 1/2" PVC WATER AS SPECIFIED. PROVIDE CAUTION TAPE ABOVE WATER LINE IN TRENCH "NONPOTABLE WATER" △
10. INSTALL TWO (2) SLOTTED DRAINS, 75 LF AS SPECIFIED. SEE DETAIL 4-C2. △
11. INSTALL 23 LF 1 1/2" SUCTION LINE CONDUIT IN ACCORDANCE WITH APPLICABLE CODE. COORDINATE ACTUAL SIZE AND LOCATION WITH WASH EQUIPMENT MANUFACTURE. TERMINATE WITH PLUG BELOW GRADE. △
12. INSTALL 24 LF 6" DIP WITH C.O. AS SHOWN AND 3 LF 4" PVC RETURN LINE IN ACCORDANCE WITH APPLICABLE CODE. PROVIDE TRANSITION COUPLING AS SHOWN. COORDINATE ACTUAL SIZE AND LOCATION WITH WASH EQUIPMENT MANUFACTURER. TERMINATE WITH PLUG BELOW GRADE. △
13. INSTALL 22 LF 4" DIP AND 3 LF 4" PVC SANITARY SEWER IN ACCORDANCE WITH APPLICABLE CODE. PROVIDE TRANSITION COUPLING AS SHOWN. COORDINATE ACTUAL SIZE AND LOCATION WITH WASH EQUIPMENT MANUFACTURER. TERMINATE WITH PLUG BELOW GRADE. △
14. INSTALL 3 LF 8" DIP AND 43 LF PVC TOTAL THROUGH TROUGH DRAIN GRADE BEAM IN ACCORDANCE WITH APPLICABLE CODE. PROVIDE GRADE BEAM PENETRATION DETAIL TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
15. INSTALL 3+ LF 4" DIP FOR FUTURE FLOOR DRAIN IN ACCORDANCE WITH APPLICABLE CODE COORDINATE LOCATION AND SIZE WITH WASH EQUIPMENT MANUFACTURER. TERMINATE WITH PLUG BELOW GRADE. △
16. FUTURE 4" INDIRECT WASTE DRAIN (JR SMITH 3400-14) IN ACCORDANCE WITH APPLICABLE CODE. COORDINATE LOCATION AND SIZE WITH WASH EQUIPMENT MANUFACTURER. TOP DRAIN = 358.0 △
17. ALL SANITARY SEWER FIXTURES SHALL BE VENTED IN ACCORDANCE WITH UPC AS AMENDED BY OREGON. △
18. ALL TRAPPED RECEPTORS TO HAVE ABOVE GROUND PRIMERS △

STRUCTURE NOTES:

1. FOUNDATION DESIGN SHOWN FOR REPRESENTATIVE RIGID FRAME BUILDING. CONTRACTOR SHALL FURNISH FOR THE REVIEW AND APPROVAL OF THE STRUCTURAL ENGINEER AN ANALYSIS AND FOUNDATION DESIGN FOR THE ACTUAL BUILDING TO BE CONSTRUCTED. ALL ADDITIONAL CONSTRUCTION COSTS DUE TO ANY REQUIRED CHANGES TO THE FOUNDATION PLAN AND DETAILS SHALL BE BORNE BY THE CONTRACTOR. ALLOW FIVE WORKING DAYS FOR THE STRUCTURAL ENGINEER'S REVIEW OF THE CONTRACTOR'S ANALYSIS AND DESIGN.
2. THE CONTRACTOR'S FOUNDATION ANALYSIS AND DESIGN MUST ADEQUATELY DEFINE THE LOCATIONS, LOADINGS, SIZING AND ALL OTHER DETAILS OF THE BUILDING'S ANCHORAGE TO THE FOUNDATION. CONSTRUCTION WHICH INCLUDES ANY PORTION OF THE FOUNDATION ANCHORAGE SHALL NOT BE COMPLETED UNTIL THE CONTRACTOR'S ANALYSIS AND DESIGN HAS BEEN APPROVED BY THE STRUCTURAL ENGINEER.
3. ALL MATERIAL AND WORKMANSHIP SHALL CONFORM TO THE PROJECT SPECIFICATIONS AND TO THE UNIFORM BUILDING CODE, 1994 EDITION, AS AMENDED BY THE STATE OF OREGON. DESIGN WAS BASED UPON THE STRENGTH AND DEFLECTION CRITERIA OF THE LATTER PUBLICATION. ALLOWABLE SOIL BEARING PRESSURE WAS TAKEN AS 1500 PSF.
4. CONCRETE SHALL BE COMMERCIAL GRADE WITH A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI. CONCRETE MEMBERS WERE DESIGNED BY THE LOAD FACTOR DESIGN METHOD. GROUT SHALL BE NONSHRINK WITH A MINIMUM DESIGN STRENGTH OF 5000 PSI.
5. THE SITE IS CONTAINED WITHIN SEISMIC ZONE 3 AND THE DESIGN WIND LOAD SHALL BE AS SPECIFIED. △
6. REINFORCING STEEL LAP SPLICES SHALL BE 25 INCHES UNLESS SHOWN OTHERWISE FOR NO. 5 BARS AND 20 INCHES UNLESS SHOWN OTHERWISE FOR NO. 4 BARS. HOOKS ON NO. 6 BARS SHALL BE 18 INCHES. MECHANICAL AND WELDED SPLICES, IF REQUIRED, SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF THE CONCRETE REINFORCING STEEL INSTITUTE.
7. REINFORCING STEEL SHALL BE DEFORMED AND HAVE A MINIMUM YIELD STRENGTH OF 40ksi
8. SUBGRADE PREP SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. COMPACT TO TO 95% MAX. DENSITY AT ±2.0% OPTIMUM MOISTURE. CRUSHED ROCK BEDDING MTLS SHALL BE AS SPEC'D COMPACT TO 95% MAX DENSITY AT ±2.0% OPTIMUM MOISTURE

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FOUNDATION PLAN
CITY OF GRESHAM
DEPARTMENT OF ENVIRONMENTAL SERVICES
OPERATIONS CENTER
GRESHAM STORMWATER DECANT STATION/VEHICLE WASH OREGON

APPROVED CITY OF GRESHAM
DATE

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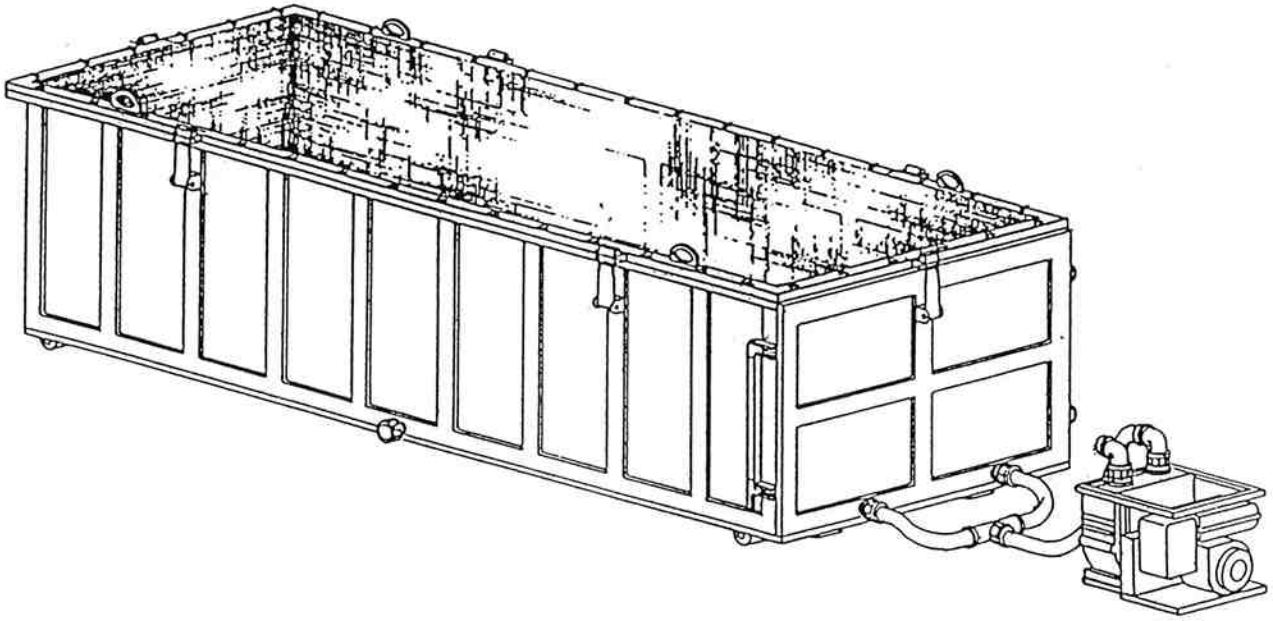
CONTAINER FILTER

ROLL-OFF MODEL



VACUUM PUMP

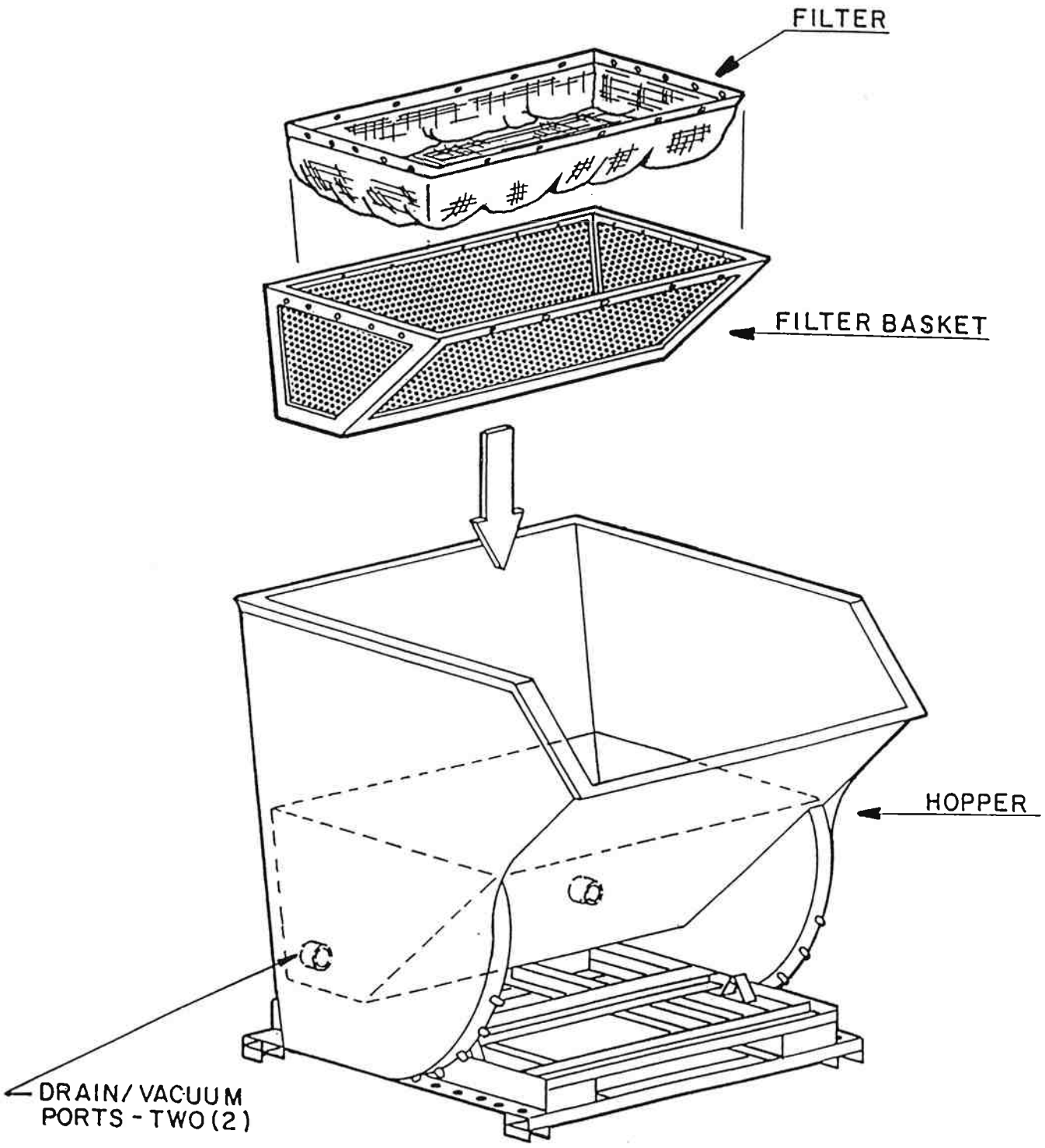
AVAILABLE SIZES: 10,20,30 & 40 CUBIC YARDS

FLO TREND SYSTEMS, INC.

707 Lehman
Houston, Texas 77018
Telephone (713) 699-0152
Fax (713) 699-8054

FLO TREND SYSTEMS, INC.

CONTAINER FILTER, SELF DUMPING STYLE



Patent Numbers 4,871,454

707 LEHMAN
HOUSTON, TEXAS 77018-1513

CONTAINER FILTERS
GRAVITY/VACUUM STYLE

PRICE SCHEDULE
August 1, 1996

SELF DUMPING OPEN TOP CONTAINER FILTER

MODEL	CAPACITY YD³	RETAIL
ET-0-5-O-G/V	½	$ 3,300.00
ET-1-0-O-G/V	1	$ 4,250.00
ET-1-5-O-G/V	1½	$ 4,750.00
ET-2-0-O-G/V	2	$ 5,575.00
ET-2-5-O-G/V	2½	$ 6,020.00
ET-3-0-O-G/V	3	$ 6,400.00
ET-4-0-O-G/V	4	$ 6,860.00
ET-5-0-O-G/V	5	$ 7,175.00

LUGGER OPEN TOP CONTAINER FILTER

MODEL	CAPACITY YD³	RETAIL
LB-5-O-G/V	5	$ 8,900.00
LB-8-O-G/V	8	$11,500.00
LB-10-O-G/V	10	$13,450.00
LB-12-O-G/V	12	$14,965.00
LB-16-O-G/V	16	$17,350.00
LB-18-O-G/V	18	$18,200.00
LB-20-O-G/V	20	$19,250.00

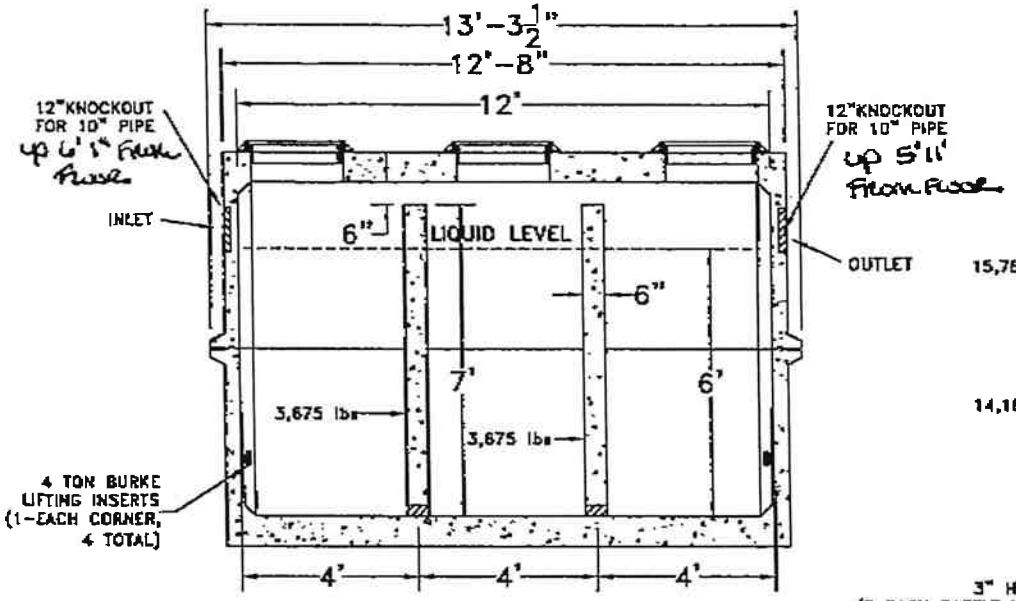
ROLL-OFF OPEN TOP CONTAINER FILTER

MODEL	CAPACITY YD³	RETAIL
RB-20-O-G/V	20	$22,150.00
RB-25-O-G/V	25	$24,750.00
RB-30-O-G/V	30	$27,200.00
RB-40-O-G/V	40	$29,225.00

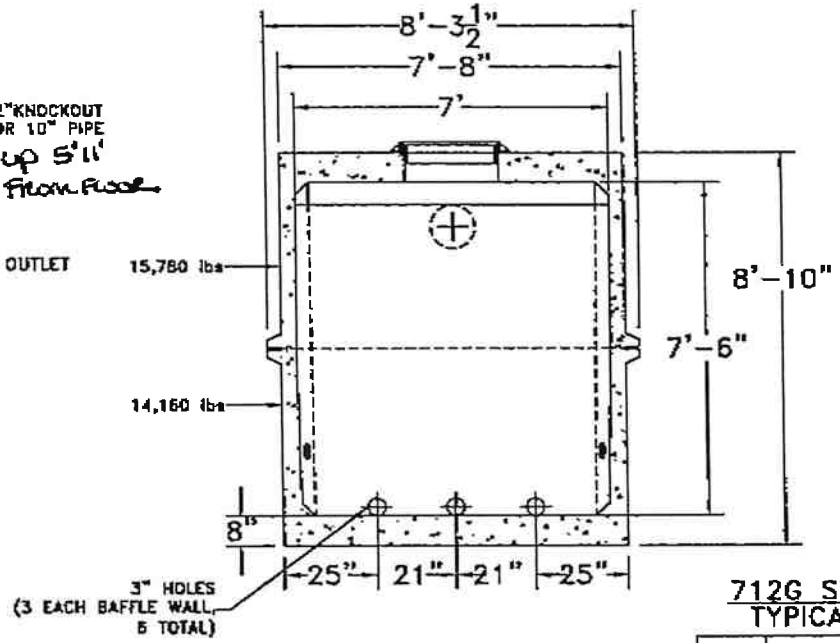
Adder for Sandblast, Epoxy Prime, & Industrial Enamel Top Coat - Add 20%

Closed Top Containers are available in Self-Dumping, Lugger and Roll-Off Models.
Prices Available Upon Request

FLO TREND SYSTEMS, INC.



SECTION AA



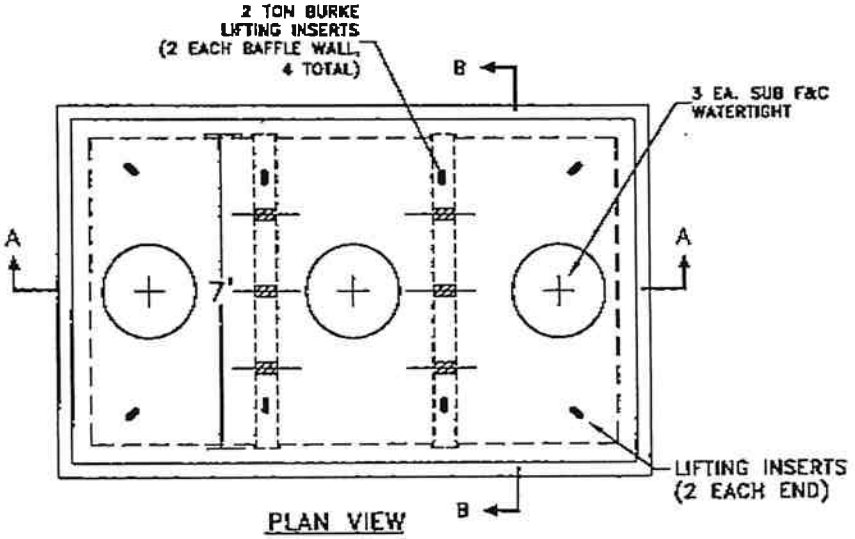
SECTION BB

712G SPECIAL VAULTS
TYPICAL – 4 EACH

	W	L	H
ID	7'-0"	12'-0"	7'-6"
OD	7'-8"	12'-8"	8'-10"

NOTES:

(1) CONCRETE: 28 DAY STRENGTH f'c = 4500 PSI
(2) REBAR: ASTM A-615 GRADE 60
(3) MESH: ASTM A-185 GRADE 65
(4) DESIGN : ACI-318-83 BUILDING CODE
ASTM C-857 MIN. STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES.
(5) LOADS: H-20 TRUCK WHEEL W/30% IMPACT
(6) ALL WALLS ARE SOLID
(7) NO KNOCKOUT WAFFLES
(8) NO LIGHTNING PANELS



PLAN VIEW

F5-1

PRODUCED ON AUTOCAD 12

PLOT SCALE 1=1

755 N.E. Columbia Blvd.
(P.O. Box 11305)
Portland, OR. 97211
(503) 285-8391

Pipe

5032 Dallas Hwy. N.W.
(P.O. Box 5249)
Salem, OR. 97304
(503)585-7350

Pacific International Pipe Enterprises, Inc.

CONTRACTOR: UNIFIED SEWER AGENCY

TITLE: 712-G SPECIAL
4 EACH TYPICAL

JOB: DECANT STATIONS

REV.	DATE	DESCRIPTION	BY	CHK

SCALE: NTS | DRAWN: A.M.S. | DWG. NO. V112095
DATE: 11-20-85 | CHECKED: G.H.

APPENDIX G

SELECTED ROADWASTE ANALYTICAL DATA

G1. ODOT Region 1 (Portland Metro area) Roadwaste Data – July 1996 to August 1997
G2. WsDOT Roadwaste Data – from "Management of Hazardous Waste from Highway Operations," 1993
G3. Washington DOE Roadwaste Data – from "Contaminants in Vactor Truck Wastes," 1993
G4. Massachusetts Highway Department Roadwaste Data – from "Development of Guidelines for Presampling Street Sweepings for Toxicity and Beneficial Reuse," 1997

Table 1.5
Chemical Analysis of Road Sweepings
Wilsonville Site
Sample Date: July 12, 1996

	Site#					
	1A	1B	2A	2B	3A	3B
Parameter	Concentration (ppm)					
Total metals						
Cadmium	0.5	0.85	0.62	1.4	1.3	2.1
Copper	12	14	14	28	95	37
Lead	25	21	18	120	120	110
Zinc	50	66	61	150	160	350
TPH	690	740	790	2700	1400	2100
TCLP Lead	n/a	n/a	n/a	0.34	n/a	n/a
Gasoline	ND	ND	ND	ND	ND	ND
Diesel	DET*1	DET*1	DET*1	DET*1	DET*1	DET*1
Heavy/Oil	DET	DET	DET	DET	DET	DET
TPH-HCID per Oregon DEQ 1-Chrolooctadene*	114	128	125	98	110	108

Notes:
1. *Two samples (A and B) were collected from each of three piles present at Wilsonville (1, 2, and 3)*
2. *ND: None detected at or above method reporting level*
3. *DET: Detected*
4. *DET*: Detected hydrocarbons appear to be due to overlap of heavy/oil range hydrocarbons*
5. **Surrogate recoveries (%)*

Table 1.6
Chemical Analysis of Road Sweepings
North Portland Site

	Screen size (in)			
	none*	none**	1-1/4**	3/4**
Parameter	Concentration (ppm)			
TPH	3,880	2.070	1.860	1.570
TCLP Metals				
Arsenic	< 0.05	<0.12	<0.12	<0.12
Barium	0.96	0.95	1.04	0.91
Cadmium	0.01	0.01	0.02	<0.01
Chromium	0.02	0.02	0.02	0.02
Lead	0.32	0.23	0.20	0.21
Mercury	< 0.0004	<0.0004	<0.0004	<0.0004
Selenium	< 0.07	<0.14	<0.14	<0.14
Silver	<0.08	<0.02	<0.02	<0.02

Notes:
**Sample date: 10/18/96*
*** Sample date: 1/13/97*

1997 Sweepings data

Marquam Composite Sample Sample Date: Aug 4, 1997	Concentration ppm	Detection Limit ppm
Total Lead	220	2.5
Acenaphthene	ND	0.005
Acenaphthylene	ND	0.005
Anthracene	0.018	0.005
Benzo (A) Anthracene	0.097	0.005
Benzo (A) Pyrene	0.095	0.05
Benzo (B) Flouoranthene	0.089	0.05
Benzo (GHI) Perylene	0.17	0.05
Benzo (K) Fluoranthene	0.089	0.05
Chrysene	0.11	0.005
Dibenzo (AH) Anthracene	ND	0.05
Flourlanthene	0.23	0.005
Flourene	0.047	0.005
Indfno (1,2,3-CD) Pyrene	ND	0.05
Napthalene	0.033	0.005
Pheneaniherene	0.16	0.005
Pyrene	0.22	0.005
Surrogate (% recovery)	54	50 to 100
TPH	1.600	50
TCLP Metals		
Arsenic	0.14	0.12
Barium	1.3	0.02
Cadmium	0.010	0.01
Chromium	0.030	0.01
Lead	0.099	0.06
Mercury	ND	0.0003
Selenium	0.14	0.14
Silver	ND	0.02

Wilsonville Composite Sample Sample Date: Aug 4, 1997	Concentration ppm	Detection Limit ppm
Total Lead	140	2.3
Acenaphthene	0.028	0.005
Acenaphthylene	0.010	0.005
Anthracene	0.031	0.005
Benzo (A) Anthracene	0.13	0.005
Benzo (A) Pyrene	0.092	0.05
Benzo (B) Flouoranthene	0.11	0.05
Benzo (GHI) Perylene	0.14	0.05
Benzo (K) Fluoranthene	0.11	0.05
Chrysene	0.17	0.005
Dibenzo (AH) Anthracene	ND	0.05
Flourlanthene	0.27	0.005
Flourene	0.056	0.005
Indfno (1,2,3-CD) Pyrene	0.052	0.05
Napthalene	0.042	0.005
Pheneaniherene	0.21	0.005
Pyrene	0.29	0.005
Surrogate (% recovery)	54	50 to 100
TPH	2.380	50
TCLP Metals		
Arsenic	0.14	0.12
Barium	1.8	0.02
Cadmium	0.011	0.01
Chromium	0.029	0.01
Lead	ND	0.06
Mercury	ND	0.0003
Selenium	ND	0.14
Silver	ND	0.02

G1-2

Final Report
for
Research Project GC8720, Task 10
"Management of Hazardous Wastes from Highway Maintenance Operations"

MANAGEMENT OF HAZARDOUS WASTE FROM HIGHWAY MAINTENANCE OPERATIONS

by

Ervin Hindin
Professor
Washington State Transportation Center (TRAC)
Civil and Environmental Engineering
Washington State University
Pullman, Washington 99164-2910

Washington State Department of Transportation
Technical Monitor
E.O. Hannus

Prepared for

Washington State Transportation Commission
Department of Transportation
and in cooperation with
U.S. Department of Transportation
Federal Highway Administration

March 1993

TABLE 6 PAH CONCENTRATION IN HIGHWAY MAINTENANCE WASTES

PAH	Road Sweepings				Wet Vactor Sludge (ug/kg)		Ditch Spoils (ug/kg)	
	Fresh (ug/kg)		Weathered (ug/kg)					
	Arth. Av.	Range	Arth. Av.	Range	Arth. Av.	Range	Arth. Av.	Range
Acenaphthylene	448	448						
Acenaphthene	335	335						
Fluorene	530	530						
Phenathrene	2178	2178	385	350-420	363	363		
Anthracene	433	395-475	393	369-415	369	369	655	655
Fluoranthene	564	389-995	605	605				
Pyrene	728	397-1980	454	375-575	413	395-430	415	415
Benzo (a) anthracene	560	395-875	400	375-425				
Chrysene	350	350					375	375
Benzo (b) fluoranthene	433	410-465	508	410-605	375	375	856	856
Benzo (k) fluoranthene	393	375-410	399	375-438	475	475	395	395
Benzo (a) pyrene	406	352-467					350	350
Dibenzo (a,h) anthracene	387	387					350	350
Benzo (g,h,i) perylene							368	368

NOTE: Minimum detectable quantity for cach PAHs = 330 ug/kg based on a 25 gram sample.

CONTAMINANTS IN VACTOR TRUCK WASTES

Prepared for

Helen Pressley and Ann Wessel
Water Quality Program
Department of Ecology

by
Dave Serdar

Washington State Department of Ecology
Environmental Investigations and Laboratory Services Program
Toxics, Compliance, and Ground Water Investigations Section
Olympia, Washington 98504-7710

Water Body Nos. WA-08-1060
WA-08-1065
WA-08-1085
WA-09-1010
WA-PS-0230

April 1993

APPENDIX C

Semi–volatile organics in vactor sediment (ug/kg, dry)

Site Name	Land–Use	Date	Ecology Sample No.	Dibenzo (a,h) anth–racene	Benzo (g,h,i) perylene	1–Methyl–naphthalene	Retene	Carbazole
R–1	RES	7/22/91	308130	890 U	110 J	NA	NA	NA
R–2	RES	7/23/91	308131	7200 U	7200	NA	NA	NA
R–3	RES	7/23/91	308132	620 J	2000 J	NA	NA	NA
R–16	RES	7/31/91	308142	2800 U	2800 U	NA	NA	NA
21 Oaks–AM	RES	3/23/92	137000	210 J	280	130	560	460 U
21 Oaks–PM	RES	3/23/92	137001	95 U	120 U	930	110 U	95 U
Casc. Hts.–AM	RES	3/30/92	138120	160 U	160 U	21 J	160 U	830 U
Casc. Hts.–PM	RES	3/30/92	138121	590 U	590 U	88 J	740 U	3000 U
I–8	IND	7/29/91	308137	3900 U	1100 J	NA	NA	NA
I–11	IND	7/29/91	308138	1200 J	3600 J	NA	NA	NA
I–12	IND	7/30/91	308139	4500 U	910 J	NA	NA	NA
I–15	IND	7/30/91	308140	4900 U	650 J	NA	NA	NA
I–15(Dup.)	IND	7/30/91	308141	2400 U	610 J	NA	NA	NA
Bailey St.	IND	3/25/92	138107	480 U	480 U	120 J	480 U	2500 U
S. Brandon	IND	4/6/92	158122	190 U	190 U	260	190 U	960 U
S. Dawson	IND	4/6/92	158123	550 U	130 J	250	210 U	1100 U
S. Dawson(Dup.)	IND	4/6/92	158124	500 U	200	150 J	200 U	1000 U
Lucile St.	IND	4/6/92	158125	500 U	250	97 J	110 J	1000 U
C–4	COM	7/24/92	308133	900 U	340 J	NA	NA	NA
C–5	COM	7/24/92	308134	870 U	2000 J	NA	NA	NA
C–6	COM	7/25/92	308135	890 U	890 U	NA	NA	NA
C–7	COM	7/25/92	308136	510 J	1300 J	NA	NA	NA

U=Undetected

J=Estimated

[ ] Indicates analyte was detected

NA=Sample not analyzed for this parameter

APPENDIX C

Semi-volatile organics in vactor sediment (ug/kg, dry)

Site Name	Land-Use	Date	Ecology Sample No.	Butyl benzyl phthalate	3,3'-Dichloro-benzidine	Benzo(a) anthracene	Bis(2-ethyl-hexyl-phthalate	Chrysene	Di-n-octyl phthalate	Benzo(b) fluor-anthene	Benzo(k) fluor-anthene	Benzo(a) pyrene	Indeno (1,2,3-cd)-pyrene
R-1	RES	7/22/91	308130	260 J	1800 U	890 U	1700	190 J	890 U	150 J	160 J	150 J	890 U
R-2	RES	7/23/91	308131	7200 U	14000 U	6500 J	6500 J	11000	7200 U	15000	12000	13000	8100
R-3	RES	7/23/91	308132	4300	7500 U	3000 J	11000	4000	3800 U	2600 J	2600 J	3000 J	2300 J
R-16	RES	7/31/91	308142	2800 U	5600 U	330 J	4900	390 J	2800 U	290** J	290** J	290 J	2800 U
21 Oaks-AM	RES	3/23/92	137000	NA	NA	1800	NA	1000	NA	1800	460	640	710 J
21 Oaks-PM	RES	3/23/92	137001	NA	NA	290	NA	370	NA	330	140	250	170 J
Casc. Hts.-AM	RES	3/30/92	138120	NA	NA	160 U	NA	160 U	NA	160 U	160 U	160 U	160 U
Casc. Hts.-PM	RES	3/30/92	138121	NA	NA	590 U	NA	590 U	NA	590 U	590 U	590 U	590 U
I-8	IND	7/29/91	308137	550 J	7700 U	1600 J	5200	2200 J	3900 U	1500 J	1300 J	1500 J	1300 J
I-11	IND	7/29/91	308138	4600 U	9100 U	5100	6000	6700	4600 U	4300 J	4500 J	4300 J	3800 J
I-12	IND	7/30/91	308139	4500 U	9000 U	1300 J	10000	2000 J	4500 U	1100 J	1300 J	1100 J	800 J
I-15	IND	7/30/91	308140	4900 U	9800 U	980 J	11000	1400 J	4900 U	790 J	850 J	740 J	570 J
I-15(Dup.)	IND	7/30/91	308141	2400 U	4800 U	960 J	12000	1300 J	2400 U	1300 J	2400 U	830 J	460 J
Bailey St.	IND	3/25/92	138107	NA	NA	1300	NA	1500	NA	1500	630	1000	750 J
S. Brandon	IND	4/6/92	158122	NA	NA	360	NA	360	NA	570	190 U	190 U	190 U
S. Dawson	IND	4/6/92	158123	NA	NA	180 J	NA	310	NA	400	210 U	230	170 J
S. Dawson(Dup.)	IND	4/6/92	158124	NA	NA	270	NA	410	NA	540	160 U	270	240
Lucile St.	IND	4/6/92	158125	NA	NA	370	NA	500	NA	730	200	360	280
C-4	COM	7/24/92	308133	150 J	1800 U	420 J	4400	640 J	900 U	540 J	720 J	480 J	340 J
C-5	COM	7/24/92	308134	640 J	8200 U	2700 J	20000	3700 J	4100 U	5400**	5400**	3000 J	2400 J
C-6	COM	7/25/92	308135	890 U	1800 U	890 U	3100	890 U	890 U	100** J	100** J	90 J	890 U
C-7	COM	7/25/92	308136	1200 J	7700 U	1900 J	30000	2600 J	3800 U	2200 J	2500 J	1900 J	1500 J

U=Undetected

J=Estimated

[ ] Indicates analyte was detected

NA=Sample not analyzed for this parameter

**Sum of benzo(b)fluoranthene + benzo(k)fluoranthene

Development of Guidelines for Presampling Street Sweepings for Toxicity and Beneficial Reuse

Final Report

by

Thomas Paul Jackivicz, Professor
Department of Civil and Environmental Engineering
University of Massachusetts Dartmouth
285 Old Westport Road
North Dartmouth, Massachusetts 02747-2300

Report of Research Conducted for:

Massachusetts Highway Department
10 Park Plaza
Boston, MA 02116-3973

in Conjunction With
MHD/UMass Transportation Research Program

University of Massachusetts Transportation Center
224 Marston Hall, Box 35223
Amherst, Massachusetts 01003-5223
Telephone: (413) 545-3728
FAX: (413) 545-9569

February 1997

University of Massachusetts
Transportation Center

MASS HIGHWAY

DEVELOPMENT OF GUIDELINES FOR PRESAMPLING STREET SWEEPINGS FOR TOXICITY AND BENEFICIAL REUSE

FEBRUARY 1997

UMTC-96-6

APPENDIX 3-1a, 3-1b

Analytes Tested for and Detected: Statewide;

Statewide Population Statistics

TABLE 3-1a

ANALYTES TESTED FOR AND DETECTED: STATEWIDE

ORGANICS
- VOCs (8260)
  - Tetrachloroethene
  - Xylenes
  - n-Butylbenzene
  - sec-Butylbenzene
  - o-chlorotoluene
  - Naphthalene
  - 1,3,5-Trimethylbenzene
  - 1,2,4-Trimethylbenzene
- TPH (8100M)
  - Fuel Oil #2/Diesel
  - Fuel Oil #6
  - Motor Oil
  - Kerosene
- TPH (8015M)
  - Xylenes
  - Heavy Ends
- PAH (8270)
  - Flouranthene
  - Napthalene
  - Benzo (a) anthracene
  - Benzo (a) pyrene
  - Benzo (b) flouranthene
  - Benzo (k) flouranthene
  - Benzo (b,k) flouranthene
  - Chrysene
  - Benzo (g,h,i) perylene
  - Flourene
  - Phenanthrene
  - Dibenzo (a,h) anthracene
  - Indeno (1,2,3-cd) pyrene
  - Pyrene
  - 1-Methylnaphthalene
  - 2-Methylnaphthalene
- PCBs (8080)
  - Arochlor 1254
  - Arochlor 1260

INORGANICS
- Specific Conductance
- Total Solids
- Chloride

TOTAL METALS
- Arsenic
- Barium
- Cadmium
- Chromium
- Lead
- Sodium

TCLP METALS
- Barium
- Cadmium
- Lead

TABLE 3-1b

STATEWIDE POPULATION STATISTICS

Analyte	Units	RDL	Statewide Statistics (Districts 1, 2, 3, 4 and 5)							
ORGANICS										
VOCs (8260)										
Tetrachloroethene	ug/kg	7.5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			3	16.00	14.00	4.36	13.00	21.00	13.00	21.00
Xylenes	ug/kg	5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	88.0	88.0	87.7	26.0	150.0	*	*
n-Butylbenzene	ug/kg	25	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	940.00	940.00	*	940.00	940.00	*	*
sec-Butylbenzene	ug/kg	25	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	130.00	130.00	*	130.00	130.00	*	*
o-chlorotoluene	ug/kg	25	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	2600.0	2600.0	*	2600.0	2600.0	*	*
Naphthalene	ug/kg	25	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	490.00	490.00	*	490.00	490.00	*	*
"1,3,5-Trimethylbenzene"	ug/kg	25	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	146	146	161	32	260	*	*
"1,2,4-Trimethylbenzene"	ug/kg	25	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	525	525	672	50	1000	*	*
TPH (8100M)										
Fuel Oil #2/Diesel	mg/kg	100	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	7400.0	7400.0	*	7400.0	7400.0	*	*
Fuel Oil #6	mg/kg	100	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	4100.0	4100.0	*	4100.0	4100.0	*	*
Motor Oil	mg/kg	100	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			62	828.4	670.0	530.5	110.0	2400.0	427.5	1100.0
Kerosene	mg/kg	100	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	650.00	650.00	*	650.00	650.00	*	*

Analyte	Units	RDL	Statewide Statistics (Districts 1, 2, 3, 4 and 5)						
TPH (8015M)									
Xylenes	ug/kg	50	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	390.00	390.00	*	390.00	390.00	*	*
TPH (8015M)									
Heavy Ends	ug/kg	50	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	2600	2600	1131	1800	3400	*	*
PAH (8270)									
Flouranthene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			54	1808	1050	1958	240	8600	660	2325
Napthalene	ug/kg	440	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	7300	7300	*	7300	7300	*	*
Benzo (a) anthracene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			32	1044	685	1338	160	7300	345	1100
Benzo (a) pyrene	ug/kg	760	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			29	787	580	641	150	2400	330	995
Benzo (b) flouranthene	ug/kg	360	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			12	1292	865	1034	290	3000	428	2425
Benzo (k) flouranthene	ug/kg	360	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	1042	725	837	250	2600	428	1675
"Benzo (b,k) flouranthene"	ug/kg	720	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			21	1218	1000	742	310	3000	635	1800
Chrysene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			38	1078	745	882	260	3700	510	1250
"Benzo (g,h,i) perylene"	ug/kg	1000	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			11	760	620	438	210	1400	380	1300
Flourene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			3	310.0	240.0	166.4	190.0	500.0	190.0	500.0
Phenanthrene	ug/kg	520	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			42	1207	780	1201	180	5700	480	1400
"Dibenzo (a,h) anthracene"	ug/kg	960	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	1365	1365	1464	330	2400	*	*

Analyte	Units	RDL	Statewide Statistics (Districts 1, 2, 3, 4 and 5)							
PAH (8270)										
"Indeno (1,2,3-cd) pyrene"	ug/kg	960	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			18	725	605	455	96	1600	417	1018
Pyrene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			54	1440	820	1520	220	7000	558	1925
1-Methylnaphthalene	ug/kg	1400	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	2900.0	2900.0	*	2900.0	2900.0	*	*
2-Methylnaphthalene	ug/kg	360	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	7500.0	7500.0	*	7500.0	7500.0	*	*
PCBs (8080)										
Arochlor 1254	ug/kg	250	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	810.00	810.00	*	810.00	810.00	*	*
Arochlor 1260	ug/kg	250	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	350.00	350.00	*	350.00	350.00	*	*
INORGANICS										
Specific Conductance	umhos/cm1		N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			69	92.5	50.0	158.8	13.0	1200.0	36.0	72.5
Total Solids	%	0.1	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			69	93.957	95.000	4.387	83.000	100.000	91.000	97.000
Chloride	mg/kg	10	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			67	161.2	25.0	700.5	11.0	5700.0	18.0	48.0
TOTAL METALS										
Arsenic	mg/kg	0.2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			69	2.684	2.400	1.323	0.620	6.300	1.600	3.600
Barium	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			69	22.35	18.00	17.90	6.80	120.00	14.00	23.00
Cadmium	mg/kg	0.4	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			5	0.5620	0.4200	0.2112	0.4100	0.8800	0.4150	0.7800
Chromium	mg/kg	0.8	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			69	18.82	15.00	15.62	3.60	100.00	10.00	23.00

Analyte	Units	RDL	Statewide Statistics (Districts 1, 2, 3, 4 and 5)							
TOTAL METALS										
Lead	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			69	68.0	31.0	144.7	8.4	1000.0	22.0	59.0
Sodium	mg/kg	20	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			62	195.4	91.5	406.4	25.0	3100.0	64.8	180.0
TCLP METALS										
Barium	mg/l	0.5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			11	1.000	0.900	0.458	0.500	1.700	0.600	1.600
Cadmium	mg/l	0.1	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			1	0.10000	0.10000	*	0.10000	0.10000	*	*
Lead	mg/l	0.5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			5	1.360	1.300	0.615	0.900	2.400	0.900	1.850

APPENDIX 3-2 (a-f)

Analytes Tested for and Detected: Statewide;

District Population Statistics

TABLE 3-2a

ANALYTES TESTED FOR AND DETECTED BY DISTRICT

District 1	District 2	District 3	District 4	District 5
ORGANICS	ORGANICS	ORGANICS	ORGANICS	ORGANICS
TPH (8100M)	TPH (8100M)	TPH (8100M)	VOCs (8260)	TPH (8100M)
Motor Oil	Motor Oil	Motor Oil	Tetrachloroethene	Motor Oil
PAH (8270)	PAH (8270)	PAH (8270)	Xylenes	PAH (8270)
Flouranthene	Flouranthene	Flouranthene	TPH (8100M)	Flouranthene
Chrysene	Benzo(a)anthracene	Benzo(a)anthracene	Motor Oil	Benzo(a)anthracene
Phenanthrene	Benzo(a)pyrene	Benzo(a)pyrene	PAH (8270)	Benzo(a)pyrene
Pyrene	Benzo(k)flouranthene	Benzo(b)flouranthene	Flouranthene	Benzo(b)flouranthene
INORGANICS	Benzo(b,k)flouranthene	Benzo(k)flouranthene	Benzo(a)anthracene	Benzo(k)flouranthene
Spec. Conductance	Chrysene	Benzo(b,k)flouranthene	Benzo(a)pyrene	
Benzo(b,k)flouranthene				
Total Solids	Phenanthrene	Chrysene	Benzo(b)flouranthene	Chrysene
Chloride	Indeno(1,2,3-cd)pyrene	Phenanthrene	Benzo(k)flouranthene	Benzo(g,h,i)perylene
TOTAL METALS	Pyrene	Indeno(1,2,3-cd)pyrene	Benzo(b,k)flouranthene	Flourene
Arsenic	INORGANICS	Pyrene	Chrysene	Phenanthrene
Barium	Specific Conductance	INORGANICS	Benzo(g,h,i)perylene	Indeno(1,2,3-
cd)pyrene				
Chromium	Total Solids	Specific Conductance	Phenanthrene	Pyrene
Lead	Chloride	Total Solids	Indeno(1,2,3-cd)pyrene	INORGANICS
Sodium	TOTAL METALS	Chloride	Pyrene	Specific Conductance
TCLP METALS	Arsenic	Arsenic	INORGANICS	Total Solids
Barium	Barium	Barium	Specific Conductance	Chloride
	Chromium	Chromium	Total Solids	TOTAL METALS
	Lead	TOTAL METALS	Chloride	Arsenic
	Sodium	Lead	TOTAL METALS	Barium
	TCLP METALS	Sodium	Arsenic	Chromium
	Barium	TCLP METALS	Barium	Lead
		Barium	Cadmium	Sodium
		Lead	Chromium	
			Lead	
			Sodium	
			TCLP METALS	
			Barium	
			Lead	

TABLE 3-2b

DISTRICT 1 POPULATION STATISTICS

Analyte	Units	RDL	District 1 Statistics						
ORGANICS									
TPH (8100M)									
Motor Oil	mg/kg	100	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			18	596.1	595.0	346.6	110.0	1700.0	347.5	692.5
PAH (8270)										
Flouranthene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	852	650	528	420	2100	475	1035
Chrysene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			3	620	460	321	410	990	410	990
Phenanthrene	ug/kg	520	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			5	664	480	352	360	1200	400	1020
Pyrene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	737	560	445	350	1800	475	890
INORGANICS										
Specific Conductance	umhos/cm1		N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			18	65.0	48.5	69.4	31.0	340.0	41.5	57.7
Total Solids	%	0.1	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			18	93.33	95.00	4.67	83.00	99.00	89.50	97.00
Chloride	mg/kg	10	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			17	49.1	18.0	121.7	11.0	520.0	13.5	28.0
TOTAL METALS										
Arsenic	mg/kg	0.2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			18	1.701	1.500	0.906	0.620	3.500	0.983	2.250
Barium	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			18	18.47	15.50	8.17	9.50	39.00	13.00	21.25
Chromium	mg/kg	0.8	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			18	11.68	10.50	6.14	3.60	29.00	7.07	14.00
Lead	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			18	27.39	22.50	18.91	12.00	96.00	17.50	27.25
Sodium	mg/kg	20	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			12	102.5	85.5	111.9	30.0	450.0	47.0	92.3
TCLP METALS										
Barium	mg/l	0.5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			3	1.267	1.100	0.289	1.100	1.600	1.100	1.600

TABLE 3-2c

DISTRICT 2 POPULATION STATISTICS

Analyte	Units	RDL	District 2 Statistics						
ORGANICS									
TPH (8100M)									
Motor Oil	mg/kg	100	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			6	1317	1110	791	300	2300	735	2225
PAH (8270)									
Flouranthene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			7	1209	1300	642	400	2400	660	1400
Benzo (a) anthracene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			4	357.5	405.0	134.8	160.0	460.0	217.5	450.0
Benzo (a) pyrene	ug/kg	760	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			3	390	440	219	150	580	150	580
Benzo (k) flouranthene	ug/kg	360	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	580	580	198	440	720	*	*
"Benzo (b,k) flouranthene"	ug/kg	720	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			4	585	490	264	390	970	402	862
Chrysene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			5	622	640	241	260	940	440	795
Phenanthrene	ug/kg	520	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			6	1022	800	790	180	2400	458	1650
"Indeno (1,2,3-cd) pyrene"	ug/kg	960	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	208	208	158	96	320	*	*
Pyrene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			7	1231	1000	886	350	2900	560	1900
INORGANICS									
Specific Conductance	umhos/cm1		N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	83.8	53.0	69.9	13.0	240.0	49.5	121.5
Total Solids	%	0.1	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	92.33	95.00	4.39	85.00	97.00	88.50	95.50
Chloride	mg/kg	10	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	84.4	25.0	103.6	12.0	270.0	15.5	185.0
TOTAL METALS									
Arsenic	mg/kg	0.2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	2.444	2.400	0.646	1.300	3.600	2.050	2.850
Barium	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	26.00	23.00	10.93	12.00	43.00	17.50	36.00
Chromium	mg/kg	0.8	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	32.01	24.00	24.06	6.10	75.00	14.00	55.00
Lead	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	80.4	42.0	81.2	20.0	260.0	22.0	124.5
Sodium	mg/kg	20	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3

			9	181.1	180.0	91.5	66.0	330.0	97.0	255.0

Analyte	Units	RDL	District 2 Statistics							
TCLP METALS										
Barium	mg/l	0.5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	1.200	1.200	0.566	0.800	1.600	*	*

TABLE 3-2d

DISTRICT 3 POPULATION STATISTICS

Analyte	Units	RDL	District 3 Statistics						
ORGANICS									
TPH (8100M)									
Motor Oil	mg/kg	100	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			13	733	710	422	180	1500	400	1015
PAH (8270)									
Flouranthene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			12	2153	2200	1427	540	5000	917	2875
Benzo (a) anthracene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			10	814	810	424	220	1700	398	1025
Benzo (a) pyrene	ug/kg	760	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			7	821	950	418	320	1500	340	1000
Benzo (b) flouranthene	ug/kg	360	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	755	755	304	540	970	*	*
Benzo (k) flouranthene	ug/kg	360	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	555.0	555.0	77.8	500.0	610.0	*	*
"Benzo (b,k) flouranthene"	ug/kg	720	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			7	1880	1900	731	660	3000	1500	2400
Chrysene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			11	1075	1100	539	320	2200	620	1400
Phenanthrene	ug/kg	520	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			10	1348	1250	784	340	3100	810	1625
"Indeno (1,2,3-cd) pyrene"	ug/kg	960	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			5	628	660	252	210	880	425	815
Pyrene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			12	1748	1750	1079	420	3800	730	2475
INORGANICS									
Specific Conductance	umhos/cm1		N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	55.9	35.5	67.1	16.0	280.0	24.7	55.0
Total Solids	%	0.1	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	93.93	95.00	5.41	84.00	100.00	90.00	99.00
Chloride	mg/kg	10	N	MEAN	MEDIAN	STDE	MIN	MAX	Q1	Q3
			13	61.5	37.0	87.	11.0	330.0	19.5	46.0
Arsenic	mg/kg	0.2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	3.521	3.700	1.459	1.300	6.300	2.175	4.600
Barium	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	3.714	2.000	3.124	1.000	9.000	1.000	7.250
Chromium	mg/kg	0.4	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	13.11	12.00	5.94	5.10	24.00	7.90	18.00

Analyte	Units	RDL	District 3 Statistics						
TOTAL METALS									
Lead	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	100.7	28.5	260.0	8.4	1000.0	17.5	36.0
Sodium	mg/kg	20	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	154.6	77.5	210.3	25.0	720.0	50.5	122.5
TCLP METALS									
Barium	mg/l	0.5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			3	1.067	0.900	0.569	0.600	1.700	0.600	1.700
Lead	mg/l	0.1	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	1.3000	1.3000	0.0000	1.3000	1.3000	*	*

TABLE 3-2e

DISTRICT 4 POPULATION STATISTICS

Analyte	Units	RDL	District 4 Statistics							
ORGANICS										
VOCs (8260)										
Tetrachloroethene	ug/kg	7.5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	13.500	13.500	0.707	13.000	14.000	*	*
Xylenes	ug/kg	5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	88.0	88.0	87.7	26.0	150.0	*	*
TPH (8100M)										
Motor Oil	mg/kg	100	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	816	605	493	340	2200	490	1100
PAH (8270)										
Flouranthene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			13	1539	690	2167	240	8300	630	1800
Benzo (a) anthracene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			8	743	335	732	310	2400	322	1028
Benzo (a) pyrene	ug/kg	760	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	679	390	655	270	2200	310	950
Benzo (b) flouranthene	ug/kg	360	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	1645	1645	1916	290	3000	*	*
Benzo (k) flouranthene	ug/kg	360	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	1450	1450	1626	300	2600	*	*
"Benzo (b,k) flouranthene"	ug/kg	720	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			8	1075	990	568	310	2200	753	1300
Chrysene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			10	968	575	1009	400	3700	445	1100
"Benzo (g,h,i) perylene"	ug/kg	1000	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			3	907	1000	447	420	1300	420	1300
Phenanthrene	ug/kg	520	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			11	881	480	981	210	3600	360	1300
"Indeno (1,2,3-cd) pyrene"	ug/kg	960	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			4	930	810	526	500	1600	505	1475
Pyrene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	1157	600	1552	220	6100	440	1250
INORGANICS										
Specific Conductance	umhos/cm1		N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	72.7	52.0	69.9	26.0	280.0	31.5	73.0
Total Solids	%	0.1	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	8.9286	9.0000	0.2673	8.0000	9.0000	9.0000	9.0000
Chloride	mg/kg	10	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	51.4	23.0	98.0	14.0	390.0	18.5	35.5

Analyte	Units	RDL	District 4 Statistics						
TOTAL METALS									
Arsenic	mg/kg	0.2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	2.974	2.800	1.196	0.940	5.300	2.200	3.725
Barium	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	23.07	15.50	28.24	9.40	120.00	11.75	20.50
Cadmium	mg/kg	0.4	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			3	0.41667	0.42000	0.00577	0.41000	0.42000	0.41000	0.42000
Chromium	mg/kg	0.8	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	23.03	16.00	23.48	6.70	100.00	10.55	24.50
Lead	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	102.1	51.0	178.3	15.0	710.0	29.8	87.7
Sodium	mg/kg	20	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			13	109.9	95.0	76.2	42.0	340.0	65.5	120.0
TCLP METALS									
Barium	mg/l	0.5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	0.5500	0.5500	0.0707	0.5000	0.6000	*	*
Lead	mg/l	0.5	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			3	1.400	0.900	0.866	0.900	2.400	0.900	2.400

TABLE 3-2f

DISTRICT 5 POPULATION STATISTICS

Analyte	Units	RDL	District 5 Statistics						
ORGANICS									
TPH (8100M)									
Motor Oil	mg/kg	100	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			11	1070	1200	595	370	2400	530	1300
PAH (8270)									
Flouranthene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			13	2744	1200	2819	540	8600	815	4150
Benzo (a) anthracene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	1147	690	998	250	3000	400	2000
Benzo (a) pyrene	ug/kg	760	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			8	1091	825	881	220	2400	310	2100
Benzo (b) flouranthene	ug/kg	360	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			7	1420	1200	1062	300	2900	390	2600
Benzo (k) flouranthene	ug/kg	360	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			7	1214	830	910	250	2600	390	2200
"Benzo (b,k) flouranthene"	ug/kg	720	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			2	915.0	915.0	120.2	830.0	1000.0	*	*
Chrysene	ug/kg	640	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			9	1572	1100	1247	390	3700	520	2800
"Benzo (g,h,i) perylene"	ug/kg	100	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			6	802	735	473	260	1400	350	1325
Flourene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			3	310.0	240.0	166.4	190.0	500.0	190.0	500.0
Phenanthrene	ug/kg	520	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			11	1861	980	1844	480	5700	570	2800
"Indeno (1,2,3-cd) pyrene"	ug/kg	960	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			6	878	780	542	260	1600	402	1450
Pyrene	ug/kg	560	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			13	2172	930	2238	430	7000	675	3450
INORGANICS									
Specific Conductance	umhos/cm1		N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	189.8	70.0	316.4	27.0	1200.0	38.3	185.0
Total Solids	%	0.1	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	95.714	96.500	3.583	87.000	99.000	94.000	99.000
Chloride	mg/kg	10	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	549	78	1498	14	5700	21	293

Analyte	Units	RDL	District 5 Statistics						
TOTAL METALS									
Arsenic	mg/kg	0.2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	2.972	3.150	1.396	0.710	5.700	1.875	3.925
Barium	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	24.06	18.50	20.37	6.80	90.00	14.00	25.25
Chromium	mg/kg	0.8	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	21.00	22.00	5.90	11.00	30.00	17.00	24.50
Lead	mg/kg	2	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	45.36	46.50	17.90	18.00	68.00	28.50	65.50
Sodium	mg/kg	20	N	MEAN	MEDIAN	STDEV	MIN	MAX	Q1	Q3
			14	404	140	803	37	3100	75	273

APPENDIX H

COPIES OF PERTINENT DEQ REGULATIONS, GUIDANCE, AND DOCUMENTATION:

H1. Composting Rules
H2. Solid Waste Treatment Facilities Rules
H3. Options for Handling Petroleum Contaminated Soil from UST Cleanup Projects
H4. Policy for Reuse of Petroleum Contaminated Soil
H5. DEQ Air Quality Open Burning Rule Exemption
H6. DEQ Air Quality "Fugitive Emissions Rule"
H7. DEQ Abandoned Hazardous Waste Fact Sheet and Exemption Form

SPECIAL RULES PERTAINING TO COMPOSTING FACILITIES: APPLICABILITY

340-096-0020

This rule applies to all composting facilities, except as exempted in OAR 340-093-0050(3) (d) and (e). Composting facilities are disposal sites as defined by ORS Chapter 459, and are also subject to the requirements of OAR Chapter 340, Divisions 93, 95 and 97 as applicable. Composting facilities commencing operation prior to January 31, 1999 shall submit an application to the Department for a composting facility registration or permit within 18 months of the effective date of these rules. Following that date, composting facilities must apply for and receive a permit or registration prior to commencement of operation.

SPECIAL RULES PERTAINING TO COMPOSTING FACILITIES: TYPES OF COMPOSTING FACILITIES

340-096-0024

Composting facilities are categorized by the following criteria and shall meet the portions of this rule as listed in (1)(c), (2)(c) or (3) below:

(1) Composting facility registration: For facilities utilizing as feedstocks for composting:

(a) More than 20 tons and less than or equal to 2,000 tons of green feedstocks in a calendar year; or

(b) More than 20 tons and less than or equal to 5,000 tons of feedstocks which are exclusively yard debris and wood waste in a calendar year.

(c) Composting facilities receiving a registration shall comply with only the following items of OAR 340-096-0028: (1)(d), (2)(c), (3)(a), (3)(b), (3)(c) and (4) and are not subject to the remaining requirements of OAR 340-096-0028;

(d) Persons applying for a composting facility registration shall submit to DEQ items listed in OAR 340-093-0070 (4) (a), (b), (c) and (d) prior to receiving their registration. These facilities are subject to the procedures and requirements of OAR 340-093-0070 (1), (6) and (7), (application processing, public hearings, registration renewal), but are exempted from the remaining requirements of OAR 340-093-0070;

(e) A composting facility registration will be treated as a permit only for purposes of OAR 340-018-0030 and not for other purposes;

(f) Upon determination by the Department that a registered facility is adversely affecting human health or the environment, a registered facility may be required to apply for and meet the requirements of a composting facility general permit.

(2) Composting facility general permit: For facilities utilizing as feedstocks for composting:

(a) More than 2,000 tons of green feedstocks in a calendar year; or

(b) More than 5,000 tons of green feedstocks which are exclusively yard debris and wood waste in a calendar year.

(c) Persons receiving a composting facility general permit shall comply with all items of OAR 340-096-0028 except (2)(b), (3)(g) and (3)(i). In order to meet these requirements, composters shall have procedures in place and written documentation at the composting site available for review and acceptance by DEQ that shows all requirements have been met.

(d) Persons applying for a composting facility general permit shall comply with the requirements of "General Permit," pursuant to OAR 340-093-0070 (3).

(e) Upon determination by the Department that a facility with a composting facility general permit is adversely affecting human health or the environment, that facility may be required to apply for and meet the requirements of a composting facility full permit.

(3) Composting facility full permit: For facilities utilizing as feedstocks for composting more than 20 tons of feedstocks during a calendar year that includes any amount of non-green feedstocks. Persons applying for a composting facility full permit shall comply with all items of OAR 340-096-0028. In order to meet these requirements, these persons must submit written documents to the Department for review and approval prior to receiving their permit, as described in OAR 340-093-0050 and OAR 340-093-0070.

(4) Composting facilities exempted from requirements to obtain a permit are listed in OAR 340-093-0050 (3)(d).

(5) The Director may issue a different level of composting regulation to a facility upon receipt of a request and justification regarding special conditions based on the amount and type of unique feedstocks which do not justify scrutiny of a higher level of regulation. Justification must be substantiated by results from testing, documentation of operational procedures or other methods. Applications shall be processed in accordance with the Procedures for Issuance, Denial, Modification and Revocation of Permits as set forth in OAR 340, Division 14.

SPECIAL RULES PERTAINING TO COMPOSTING FACILITIES: CONDITIONS

340-096-0028

(1) Feasibility Study Report shall include but not be limited to:

(a) Location and design of the physical features of the site and composting plant, surface drainage control, wastewater facilities, fences, residue disposal, controls to prevent adverse health and environmental impacts, and design and

performance specifications for major composting equipment and detailed descriptions of methods to be used. Agricultural composting operations need only provide information regarding surface drainage control and wastewater facilities as required by ORS 468B.050 (1)(b), administered by the Oregon Department of Agriculture;

(b) A proposed plan for utilization of the processed compost or other evidence of assured utilization of composted feedstocks;

(c) A proposed facility closure plan of a conceptual "worst case" scenario (including evidence of financial assurance, pursuant to OAR 340-095-0090(1)) to dispose of unused feedstocks, partially processed residues and finished compost, unless exempted from this requirement by the Department pursuant to OAR 340-095-0090 (2). The plan will include a method for disposal of processed compost that, due to concentrations of contaminants, cannot be marketed or used for beneficial purposes;

(d) A mass balance calculation showing all feedstocks and amendments and all products produced. For facilities applying for a composting facility full permit, the mass balance calculation shall be detailed and utilize a unit weight throughout.

(2) Composting Facility Plan Design and Construction shall include but not be limited to:

(a) Scale drawings of the facility, including the location and size of feedstock and finished storage area(s), composting processing areas, fixed equipment, and appurtenant facilities (scales, surface water control systems, wells, offices and others). Upon determination by the Department that engineered drawings are necessary, drawings will be produced under the supervision of a licensed engineer with current registration;

(b) Lining system design: If leachate is present, composter must provide a protective layer beneath compost processing and feedstock areas, leachate sumps and storage basins to prevent release of leachate to surface water or ground water. The lining system required would be dependent on leachate characteristics, climatic conditions and size of facility and shall be capable of resisting damage from movement of mobile operating equipment and weight of stored piles. Facility operators shall monitor all water releases and document no release to ground water. A construction quality assurance plan shall be included detailing monitoring and testing to assure effectiveness of liner system;

(c) Water Quality: Composting facilities shall have no discharge of leachate, wastewater, or wash water (from vehicle and equipment washing) to the ground or to surface waters, except in accordance with permit(s) from the Water Quality Program of the Department issued under ORS 468B.050. Agricultural composters must meet water quality requirements pursuant to ORS 468B.050 (1)(b), administered by the Oregon Department of Agriculture;

(d) Access Roads: When necessary to provide public access, all-weather roads shall be provided from the public highway or roads to and within the compost operation and shall be designed and maintained to prevent traffic congestion, traffic hazards and dust and noise pollution;

(e) Fire Protection: Fire protection shall be provided in compliance with pertinent state and local fire regulations;

(f) Control of access to the site: Effective barriers to unauthorized entry and dumping shall be provided (such as fences, gates and lock(s));

(g) Control of noise, vectors, dust and litter: Effective methods to reduce or avoid noise, vectors, dust and litter shall be provided.

(3) Composting Facility Operations Plan shall include:

(a) Operations and Maintenance Manual which describes normal facility operations and includes procedures to address upset conditions and operating problems. The manual shall include monitoring of compost processing parameters including: feedstocks (C:N ratio), moisture content, aeration, pH and temperature;

(b) Odor Minimization Plan shall be developed to address odor within the confines of the composting site and include methods to address:

(A) A management plan for malodorous loads;

(B) Procedures for receiving and recording odor complaints, immediately investigating any odor complaints to determine the cause of odor emissions, and remedying promptly any odor problems at the facility;

(C) Additional odor-minimizing measures, which may include the following:

(i) Avoidance of anaerobic conditions in the composting material;

(ii) Use of mixing for favorable composting conditions;

(iii) Formation of windrow or other piles into a size and shape favorable to minimizing odors; and

(iv) Use of end-product compost as cover to act as a filter during early stages of composting.

(D) Specification of a readily-available supply of bulking agents, additives or odor control agents;

(E) Procedures for avoiding delay in processing and managing feedstocks during all weather conditions;

(F) Methods for taking into consideration the following factors prior to turning or moving composted material:

(i) Time of day;

(ii) Wind direction;

(iii) Percent moisture;

(iv) Estimated odor potential; and

(v) Degree of maturity.

(c) Methods for measuring and keeping records of incoming feedstocks;

(d) Removal of Compost: Other than for compost used on-site at an agronomic rate, compost shall be removed from the composting facility as frequently as possible, but not later than two years after processing is completed;

(e) Incorporation of feedstock(s): Feedstocks shall be incorporated into active compost piles within a reasonable time;

(f) Use of Composted Solid Waste: Composted solid waste offered for use by the public shall be relatively odor free and shall not endanger public health or safety;

(g) Pathogen reduction: Composting facilities accepting any amount of non-green feedstocks shall document and implement a pathogen reduction plan that addresses requirements of the Code of Federal Regulations, 40 CFR Part 503. The plan shall include a Process to Further Reduce Pathogen (PFRP), pursuant to 40 CFR Part 503 Appendix B, item (B) (1), dated February 19, 1993, that shall include:

(A) Using either the within-vessel composting method or the static aerated pile composting method, the temperature of the active compost pile shall be maintained at 55 degrees Celsius or higher for three days;

(B) Using the windrow composting method, the temperature of the active compost pile shall be maintained at 55 degrees Celsius or higher for 15 days or longer. During the period when the compost is maintained at 55 degrees Celsius or higher, there shall be a minimum of five turnings of the windrow; or

(C) An alternative method that can be demonstrated by permittee to achieve an equivalent reduction of human pathogens.

(h) Storage:

(A) All feedstocks deposited at the site shall be confined to the designated dumping area;

(B) Accumulation of feedstocks shall not exceed one month's production capacity and undisposed residues shall be kept to minimum practical quantities;

(C) Facilities and procedures shall be provided for handling, recycling or disposing of feedstocks that are non-biodegradable by composting;

(i) Salvage:

(A) A permittee may conduct or allow the recovery of materials such as metal, paper and glass from the composting facility only when such

recovery is conducted in a planned and controlled manner approved by the Department in the facility's operations plan;

(B) Salvaging shall be controlled so as not to interfere with optimum composting operation and not create unsightly conditions or vector harborage;

(j) Methods to minimize vector attraction (such as rats, birds, flies) shall be used in order to prevent nuisance conditions or propagation of human pathogens in the active or finished compost.

(4) Records: Annual reporting of the weight of feedstocks utilized for composting is required on a form provided by the Department. The Department may also require such records and reports as it considers are reasonably necessary to ensure compliance with conditions of a registration or permit or OAR Chapter 340, Divisions 93 through 97.

SOLID WASTE TREATMENT FACILITIES

340-096-0050

(1) Applicability. This rule applies to all solid waste treatment facilities. Such facilities are disposal sites as defined by ORS Chapter 459, and are also subject to the requirements of OAR Chapter 340, Divisions 93, 95 and 97 as applicable.

(2) Plans and Specifications. Plans and specifications for a solid waste treatment facility shall include, but not be limited to, the location and physical features of the facility such as contours, surface drainage control, access and on-site roads, traffic routing, landscaping, weigh stations, fences and specifications for solid waste handling equipment, truck and area washing facilities and wash water disposal, and water supply and sanitary waste disposal.

(3) Air Quality. A permittee shall ensure that all solid waste treatment facilities comply with air pollution control rules and regulations and emission standards of this Department or the regional air pollution control authority having jurisdiction.

(4) Bioremediation Facilities. Facilities that propose to biologically treat petroleum contaminated soil must design the operation to prevent contamination of the area and minimize the possibility of contaminants leaching to groundwater. Such facilities shall in general comply with regulations in OAR Chapter 340, Division 95, "Land Disposal Sites Other than Municipal Solid Waste Landfills," for location restrictions, operating criteria and design criteria. The following requirements also apply:

(a) To prevent leaching, design criteria must include either:

solid waste handling equipment, truck and area washing facilities and wash water disposal, and water supply and sanitary waste disposal.

(3) Design and Construction:

(a) Waste Water Discharges. There shall be no discharge of waste water to public waters except in accordance with a permit from the Department, issued under ORS 468B.050;

(b) Access roads. All weather roads shall be provided from the public highways or roads, to and within the disposal site and shall be designed and maintained to prevent traffic congestion, traffic hazards and dust and noise pollution;

(c) Drainage. The site shall be designed such that surface drainage will be diverted around or away from the operational area of the site;

(d) Fire Protection. Fire protection shall be provided in accordance with plans approved in writing by the Department and in compliance with pertinent state and local fire regulations;

(e) Fences. Access to the site shall be controlled by means of a complete perimeter fence and gates which may be locked;

(f) Solid Waste Disposal. Sanitary waste disposal shall be accomplished in a manner approved by the Department or state or local health agency having jurisdiction;

(g) Truck Washing Facilities. Truck washing areas, if provided, shall be hard surfaced and all wash waters shall be conveyed to a catch basin, drainage and disposal system approved by the Department or state or local health agency having jurisdiction.

(4) Operations:

(a) Storage:

(A) All solid waste deposited at the site shall be confined to the designated dumping area;

(B) Accumulation of solid wastes shall be kept to minimum practical quantities.

(b) Salvage:

(A) A permittee may conduct or allow the recovery of materials such as metal, paper and glass from the disposal site only when such recovery is conducted in a planned and controlled manner approved by the Department in the facility's operations plan;

(B) Salvaging shall be controlled so as to not interfere with optimum disposal operation and to not create unsightly conditions or vector harborage;

(A) A landfill-type liner with a leachate removal system. A concrete slab is not considered a liner. An applicant must demonstrate that the proposed liner is compatible with the waste; or

(B) A vadose zone monitoring system, pursuant to 40 CFR 264, Subpart M.

(b) Groundwater. The Department may require groundwater monitoring depending on the facility's cover, run-on controls and irrigation;

(c) Operating criteria:

(A) Each permittee shall ensure that surface runoff and leachate seeps are controlled so as to minimize discharges of pollutants into public waters;

(B) The permittee must ensure that the facility is operated in a manner such that the liner is not damaged;

(C) The permittee must provide a monitoring plan to demonstrate completion of the biodegradation process.

(d) Financial assurance. An application for a bioremediation solid waste treatment facility shall include a financial assurance plan sufficient to cover costs for a third party to remove the waste to a thermal desorption facility if it is deemed necessary by the Department.

(5) Records. The Department may require such records and reports as it considers are reasonably necessary to ensure compliance with conditions of a permit or OAR Chapter 340, Divisions 93 through 97.

[Publications: The publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

OPTIONS FOR HANDLING PETROLEUM CONTAMINATED SOIL

FROM UNDERGROUND STORAGE TANK CLEANUP PROJECTS

GENERAL INFORMATION

In the majority of cases when an underground storage tank (UST) is removed, soil contamination is discovered. This soil contamination is an environmental concern and may lead to the more serious problem of groundwater contamination. Before removing USTs, you should examine some of the "what ifs". Planning will save you both time and money. The following information outlines some options available for handling petroleum contaminated soils.

When confronted with contamination, you must make some difficult decisions. Should cleanup begin immediately or is further investigation required? Should the contamination be removed or is in-place treatment feasible? Will your business be unduly interrupted if soil treatment occurs on-site? Are there potential business implications, such as long-term liability, insurance requirements, future salability of the property, etc. that should be considered when selecting the cleanup method? Due to the complexity of cleanups and because of the number of remediation options available, the services of a qualified consultant are often useful when developing cleanup strategies other than simple removal of the contaminated soils.

You should be aware that the Department will not be able to complete final review and closure on your cleanup project until treatment and reuse or disposal of all contaminated soils has taken place. Since some options take longer to complete than others, this may also be a factor in the process of determining how to handle the contaminated soil.

IN-PLACE SOIL TREATMENT

Many methods for cleaning up soil contamination in-place, or "in-situ", have been used successfully. Examples of in-situ treatments include vapor extraction and biological treatment. Typically, in-situ treatment can be expensive but becomes more cost effective when large amounts of contamination are present or would be difficult to remove.

In-situ treatment methods are primarily used in conjunction with complex cleanup projects and often require that you submit a Corrective Action Plan (CAP). In order to properly prepare a Corrective Action Plan, extensive subsurface investigation is usually required in order to define the extent of the contamination. Once the full extent of the contamination has been determined, reasonable cleanup options can be developed. If you choose to pursue in-situ soil treatment through a CAP, you should contact the local DEQ regional office that has jurisdiction for your cleanup project in order to discuss the details of what will be required.

SOIL REMOVAL

If soil removal appears to be the best method for soil cleanup, a decision must be made concerning how the soils will be managed. Once the soils are removed, they can be independently treated (by you or your consultant) or taken to an authorized facility for treatment or disposal. If the soils are to be independently treated, precautions must be taken to prevent adverse environmental impacts or nuisance conditions.

Stockpiling of contaminated soils can only be conducted on a temporary basis while making arrangements for disposal or treatment. During this time, soils must be placed within a secure (i.e. fenced), lined, and bermed area and kept covered at all times. You have thirty (30) days to either dispose of the soil at an authorized facility or to obtain a solid waste treatment permit from the Department (see section on "Department Approval").

Landfill Disposal - As landfill space becomes restricted, the cost of disposal of contaminated soils may go up. Ideally, no contaminated soils would be disposed of in a landfill since this results in the problem being moved from one location to another. Also, should there be problems with the landfill in the future, or if cleanup of the landfill should be required, persons who disposed of contaminated soil in the landfill may be held partially responsible for cleanup costs. However, until alternative disposal and treatment methods become readily available, landfill disposal may be the most cost effective option for some cleanup projects.

You should be aware that individual landfills may have specific requirements that must be met before disposal is allowed. If landfill disposal is the option chosen, contact them in advance - you may be able to coordinate sampling efforts to meet both Landfill and Department requirements at the same time.

Above Ground Biological Treatment - This treatment method is excellent for gasoline contamination and works relatively well for diesel, waste oil, and other heavy hydrocarbon contamination which does not aerate readily. Since the treatment results in destruction of the contaminants, this method reduces long term liability and is a better environmental solution than soil aeration or landfill disposal. However, unless the amount of soil to be treated is large, bioremediation is a relatively costly method for dealing with contamination. The services of a qualified consultant are usually necessary in the design of an appropriate treatment system. A solid waste permit from the Department is required (see section on "Department Approval"). There are some restrictions on how the treated soil can be reused. Contact the regional DEQ office that has jurisdiction for your cleanup project for more information.

Thermal Treatment - Thermal treatment is preferred over aeration and landfill disposal. This treatment method may reduce your future liability for the contaminated soils (the "cradle to grave" philosophy). Contaminated soil can be treated on-site through the use of a mobile unit or transported to a stationary facility.

Mobile Unit - A mobile unit is especially useful for sites that are remote from a permanent thermal treatment facility or landfill. Costs in hauling the contaminated soil can be saved or reduced. However, you must be careful to ensure that your treatment site is suitable for the treatment equipment. You will need to contact local land use authorities to make sure this activity is allowed for your site. Specific information about the use of the mobile unit must be provided to the Department. A solid waste permit from the Department is required (see section on "Department Approval"). There are some restrictions on how the treated soil can be reused. Contact the regional DEQ office that has jurisdiction for your cleanup project for more information.

Permanent Facility - A permanent facility operates similar to a landfill from a "user" perspective. You must provide the facility with information about where the contaminated soils originated and contamination levels. Once your application has been approved, the contaminated soils are taken to the facility for processing. Your involvement is then over, unless you make arrangements for reusing the treated soil. Contact the specific facilities for more information on their requirements.

Soil Aeration - While treatment processes that result in the destruction of the hydrocarbons are preferred, soil aeration may be a somewhat less expensive means for dealing with soil contamination. Aeration works best for gasoline contaminated soils and has limited success with diesel or heavier hydrocarbons. This method involves the volatilization of hydrocarbons into the atmosphere. Some states prohibit this type of treatment because the hydrocarbons help to form photochemical smog (ozone). Also, gasoline contains benzene, which is a carcinogen.

While soil aeration may be a lower cost treatment option, it is by no means a "no cost" procedure. Soil aeration involves more than just spreading or piling the soil and letting it sit. The process requires the use of specific controls to prevent the creation of other problems and considerable work is needed to ensure that treatment is effective in reducing contaminant concentrations to an acceptable level. Soil aeration must include active treatment measures such as tilling or using piping and pumps to push/pull air through the soil. The Department will not approve of projects that involve the use of "passive aeration". A solid waste permit from the Department is required (see section on "Department Approval"). There are some restrictions on how the treated soil can be reused. Contact the regional DEQ office that has jurisdiction for your cleanup project for more information. More complete details on how to conduct soil aeration is contained in the guidance document "Treatment of Petroleum Contaminated Soils".

DEPARTMENT APPROVAL

If your proposal for handling the petroleum contaminated soil includes on-site or off-site bioremediation, soil aeration, or thermal treatment with a mobile unit, a solid waste permit for treatment is required. This type of permit is called a "Solid Waste Letter of Authorization" and requires the payment of a $500.00 permit fee. The Department may waive the permit fee if you are otherwise reimbursing the Department for oversight costs. You will need to obtain approval for the treatment site from the local land use authorities before you proceed.

The application for a solid waste treatment permit requires that a written Treatment Plan be prepared that demonstrates that you will be able to effectively treat the contaminated soil. The owners of the properties where the treatment will occur, and where the treated soil will be reused, must sign statements to document that they understand what the restrictions are with these activities. Permits are good for six months from the date issued. Generally, if treatment has not been successful within one treatment "season", you must find alternatives (disposal at an approved facility) for handling the soil (although there may be some exceptions, as in the case of true bioremediation projects). If you propose to treat soil from more than one cleanup project at a single location, a more comprehensive solid waste permit will be required. The Letter of Authorization contains specific permit conditions which must be met throughout the treatment period. Violations of permit conditions could result in enforcement actions that include civil penalties or revocation of the permit.

In addition to the permit requirements for treating soil, some cleanup projects may also require a Water Quality permit to discharge water from an excavation or discharge treated water from a groundwater treatment system. Prior notice must be given to the Department if there will be air emissions from pollution control equipment (such as air strippers or vapor extraction systems). Contact the local DEQ regional office that has jurisdiction for your cleanup project if either
situation might be applicable to your project.

Representative soil samples must be collected quarterly to measure the reduction of concentrations and progress reports submitted to the Department. Soil treatment activities must be coordinated with the Department throughout the project and approval received before moving any contaminated or treated soils off-site.

Regardless of the treatment methods, there are some restrictions on how the treated soil can be reused. Contact the regional DEQ office that has jurisdiction for your cleanup project for more information.

SUMMARY

To minimize treatment costs, careful advance planning is required. Although several options are presented, some are more desirable than others. From an environmental perspective, the Department strongly encourages selection of a treatment method that actually destroys contamination rather than transferring it from one media to another (e.g. from soil to air). In addition, effective treatment of soils - if done correctly - results in the ability to reuse the soil for other purposes (with some restrictions). Therefore, you may be required to submit information to "justify" the selection of other, less environmentally preferred methods for handling petroleum contaminated soil. However, the Department does recognize that these preferred treatment methods may not be equally available throughout the State at this time.

Because treatment conditions for each site are unique, the specific requirements listed in this document may be more or less stringent than what is actually needed for your site. Careful coordination and prior approval from your local DEQ regional office at specific junctures in the treatment process is extremely important. A final determination that "no further action is required" for the entire cleanup project will not be made by the Department until all details regarding the treated soils have been satisfactorily addressed and documented.

Questions about specific treatment projects, permit requirements and/or the forms to be used should be directed to the regional office that has jurisdiction for the cleanup project that the treatment is associated with.

Regional Office	Phone Number (503)
Eastern Region - Bend	388-6147
Eastern Region - Pendleton	276-4063
Eastern Region - The Dalles	298-7255
Northwest Region - Portland	229-5489
Western Region - Salem	378-8240
Western Region - Eugene	646-7838
Western Region - Medford	776-6136

The Department's toll-free, call-back number is 1-800-452-4011.

Policy Statement
Environmental Cleanup Division

Policy 550
Page 1 of 1

Michael Downs
(Approved by)

Sept 16, 1992
(Date)

POLICY FOR REUSE OF PETROLEUM CONTAMINATED SOIL

A. BACKGROUND

Many leaking underground storage tank sites produce significant volumes of petroleum contaminated soils (PCS). Frequently the owners and operators of these sites wish to treat and reuse the PCS rather than dispose of the soils in landfills. In order to protect human health, welfare, and the environment, it is necessary for DEQ to establish a formal policy recommending standards for treatment and reuse of PCS. The purpose of the policy is to define the recommended treatment standards which should be met in order to reuse PCS.

B. APPLICABILITY

This policy applies to treatment and reuse of soils contaminated by releases of petroleum products only.

C. POLICY STATEMENT

1. Soils which will be used as backfill in the excavation from which they were removed are required to be treated to the matrix cleanup standard applicable to the site of origin in accordance with OAR 340-122-335.

2. Soils which will be used off-site should meet the appropriate level one matrix cleanup standard for the substance released; if the soils are used off-site, the property owner receiving the treated soil should acknowledge in writing that the soils have been placed in accordance with this policy; this acknowledgement should also indicate that the owner of the property accepting the contaminated soil understands the nature and origin of the soils.

3. In all cases, reuse of the treated PCS should be such that soils are placed above the seasonal high groundwater level and are isolated from human contact or possible exposure. Treated PCS should not be placed in wetlands or within the 100-year floodplain.

4. In all cases, disposition of soils (including reuse on-site or off-site) must be reported to DEQ in accordance with OAR 340-122-360.

5. In accordance with OAR 340-122-250 (corrective action plan requirements), DEQ will consider alternate cleanup standards for reuse of PCS on a case by case basis; under no circumstances will DEQ approve of cleanup standards which do not adequately protect human health, safety, welfare, and the environment.

Although these treatment standards and reuse control measures are considered adequate to protect human health, safety, welfare and the environment, the Department strongly supports and encourages efforts to attain the lowest practicable treatment levels and thereby reduce the impact to the environment.

LUST\SM4688 (9/14/92)

(d) Demolition;
(e) Domestic;
(f) Industrial; or
(g) Slash.

(32) "Yard debris" means wood, needle or leaf materials from trees, shrubs or plants from the real property appurtenant to a dwelling of not more than four (4) family living units so long as such debris remains on the property of origin. Once yard debris is removed from the property of origin it becomes commercial waste. Yard debris is included in the definition of domestic waste.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468, 468A & 477
Hist.: DEQ 123, f. & ef. 10-20-76; DEQ 23-1979, f. & ef. 7-5-79; DEQ 27-1981, f. & ef. 9-8-81; DEQ 10-1984, f. 5-29-84, ef. 6-16-84; AQ 1-1992, f. & ef. 11-13-91; AQ 1-1993, f. & ef. 3-9-93

Exemptions, Statewide

340-23-035 This Division shall not apply to:

(1) Fires set for traditional recreational purposes and traditional ceremonial occasions for which a fire is appropriate provided that no materials which may emit dense smoke or noxious odors as prohibited in OAR 340-23-042(2) are burned.
(2) The operation of any barbecue equipment.
(3) Fires set or permitted by any public agency when such fire is set or permitted in the performance of its official duty for the purpose of weed abatement, prevention or elimination of a fire hazard, or a hazard to public health or safety or instruction of employes in the methods of fire fighting, which in the opinion of the agency is necessary.
(4) Agricultural open burning conducted east of the crest of the Cascade Mountains including all of Hood River and Klamath Counties.
(5) Open field burning, propane flaming, and stack and pile burning in the Willamette Valley between the crests of the Cascade and Coast Ranges pursuant to OAR Chapter 340, Division 26, Rules for Field Burning.
(6) Open burning on forest land permitted under the forest practices Smoke Management Plan filed with the Secretary of State pursuant to ORS 477.515.
(7) Fires set pursuant to permit for the purpose of instruction of employes of private industrial concerns in methods of fire fighting, or for civil defense instruction.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468, 468A & 477
Hist.: DEQ 123, f. & ef. 10-20-76; DEQ 23-1979, f. & ef. 7-5-79; DEQ 27-1981, f. & ef. 9-8-81; DEQ 10-1984, f. 5-29-84, ef. 6-16-84; AQ 1-1992, f. & ef. 11-13-91; AQ 18-1992, f. & ef. 3-11-92; AQ 1-1993, f. & ef. 3-9-93

General Requirements Statewide

340-23-040 This rule applies to all open burning within the purview of this Division whether authorized, permitted or prohibited by this Division, unless expressly limited therein, or by any other rule, regulation, permit, ordinance, order or decree of the Commission or other agency having jurisdiction:

(1) All open burning shall be constantly attended by a responsible person or an expressly authorized agent until extinguished.
(2) Each person who is in ownership, control or custody of the real property on which open burning occurs, including any tenant thereof, or who is in ownership, control or custody of the material which is burned, shall be considered a responsible person for the open burning. Any person who causes or allows open burning to be initiated or maintained shall also be considered a responsible person.
(3) It shall be the duty of each responsible person to promptly extinguish any burning which is in violation of any rule of the Commission or of any permit issued by the Department, unless the Department has given written approval to such responsible person to use auxiliary combustion equipment or combustion promoting materials to minimize smoke production and the responsible person complies with the requirements in the written approval. However, nothing in this section shall be construed to authorize any violation of OAR 340-23-042(1) or (2).
(4) To promote efficient burning and prevent excessive emissions of smoke, each responsible person shall, except where inappropriate to agricultural open burning:
    (a) Assure that all combustible material is dried to the extent practicable. This action shall include covering the combustible material when practicable to protect the material from deposition of moisture in any form, including precipitation or dew. However, nothing in this section shall be construed to authorize any violation of OAR 340-23-042(1) or (2).
    (b) Loosely stack or windrow the combustible material in such a manner as to eliminate dirt, rocks and other noncombustible material and promote an adequate air supply to the burning pile, and provide the necessary tools and equipment for the purpose.
    (c) Periodically restack or feed the burning pile and insure that combustion is essentially completed and smoldering fires are prevented

Fugitive Emissions

Definitions

340-21-050 As used in OAR 340-21-050 through 340-21-060:

(1) "Fugitive emissions" means dust, fumes, gases, mist, odorous matter, vapors or any combination thereof not easily given to measurement, collection, and treatment by conventional pollution control methods.

(2) "Nuisance conditions" means unusual or annoying amounts of fugitive emissions traceable directly to one or more specific sources. In determining whether a nuisance condition exists, consideration shall be given to all of the circumstances, including density of population, duration of the activity in question, and other applicable factors.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 37, f. 2-15-72, ef. 3-1-72; AQ 1-1993, f. & ef. 3-9-93

Applicability

340-21-055 OAR 340-21-050 through 340-21-060 shall apply:

(1) Within Special Control Areas, as established in OAR 340-21-010.

(2) When ordered by the Department, in other areas when the need for application of these rules, and the practicability of control measures, have been clearly demonstrated.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 37, f. 2-15-72, ef. 3-1-72; AQ 1-1993, f. & ef. 3-9-93

Requirements

340-21-060

(1) When fugitive emissions escape from a building or equipment in such a manner and amount as to create nuisance conditions or to violate any regulation, the Department may, in addition to other means of obtaining compliance, order that the building or equipment in which processing, handling and storage are done be tightly closed and ventilated in such a way that air contaminants are controlled or removed before discharge to the open air.

(2) No person shall cause, suffer, allow, or permit any materials to be handled, transported, or stored; or a building, its appurtenances, or a road to be used, constructed, altered, repaired or demolished; or any equipment to be operated, without taking reasonable precautions to prevent particulate matter from becoming airborne. Such reasonable precautions shall include, but not be limited to the following:

(a) Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land;

(b) Application of asphalt, oil, water, or other suitable chemicals on unpaved roads, materials stockpiles, and other surfaces which can create airborne dusts;

(c) Full or partial enclosure of materials stockpiles in cases where application of oil, water, or chemicals are not sufficient to prevent particulate matter from becoming airborne;

(d) Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;

(e) Adequate containment during sandblasting or other similar operations;

(f) Covering, at all times when in motion, open bodied trucks transporting materials likely to become airborne;

(g) The prompt removal from paved streets of earth or other material which does or may become airborne.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 37, f. 2-15-72, ef. 3-1-72; AQ 1-1993, f. & ef. 3-9-93

Oregon Waste Reduction Assistance Program

FOR TOXIC SUBSTANCES AND HAZARDOUS WASTES

F A C T S H E E T

Abandoned Hazardous Waste

Abandoned Hazardous Waste

The Department of Environmental Quality (DEQ) is conducting a pilot effort to allow persons who have containerized abandoned hazardous waste relief from paying hazardous waste generator fees and subsequent hazardous waste management fees. The DEQ defines abandoned hazardous waste narrowly: it must be containerized and there is no knowledge of the true generator.

To be eligible for fee relief any applicant must meet ALL of the following conditions.

- The hazardous waste must be containerized (in drums or other type of container), with no spillage or evidence of release to the environment.
- The hazardous waste has been illegally deposited on real property; (this does not include waste that has been discovered as a result of acquiring a piece of property of which the former owner or owners were generators of the hazardous waste.)
- The owner or operator of the property site did not generate or transport the hazardous waste to the real property site, cannot locate, and do not know who the generator was.
- The hazardous waste containers have no information from which to identify the true hazardous waste generator. This means that there are no markings (product or shipping labels) on the container that could identify the responsible party of the waste.

Who Is Responsible For Managing and Disposing of Abandoned Hazardous Waste?

The responsibility for managing abandoned hazardous waste rests on the property owner if no responsible party can be identified. Management involves identifying what the unknown material is, and if the waste is determined to be a hazardous waste, removal of the hazardous waste for disposal at a permitted hazardous waste treatment, storage, disposal or recycling (TSDR) facility.

What Does DEQ Do With Abandoned Waste?

Department of Environmental Quality ▪ 811 S.W. 6th Avenue ▪ Portland, Oregon 97204 ▪ (503) 229-5913

What Does DEQ Do With Abandoned Waste?

DEQ does not provide a disposal service for abandoned hazardous waste. DEQ may investigate illegal abandonment activity. Also, DEQ will provide technical assistance regarding the specific regulations you must comply with when identifying, storing and disposing of abandoned waste. DEQ will also provide assistance in completing the attached "Request for Fee Relief Form"

What Should I Do If I Find Abandoned Hazardous Waste On My Property?

1. Upon discovery of abandoned waste notify the DEQ regional office nearest you to report the abandoned hazardous waste (see map page 3). DEQ may choose to investigate the incident.

2. Secure the abandoned waste.

3. Conduct a "hazardous waste determination" to learn if the waste is a hazardous waste. (Use the DEQ Hazardous Waste Determination Handbook for assistance. This is available from DEQ Regional Offices.)

4. If you have questions about the management of the abandoned hazardous waste, seek guidance from your nearest DEQ regional office.

5. Arrange for the removal of the abandoned hazardous waste, to a permitted hazardous waste TSDR facility or other authorized facility (see next section).

6. Manage the abandoned hazardous waste according to the quantity amounts discussed in the next section.

7. Use the form on page 5 and 6 of this factsheet to request fee relief. Complete all information requested. Mail your request to:

   - The DEQ regional office you have been dealing with, care of the staff person(see page 3 for locations and addresses) AND;

   - Mail a duplicate request to:

     Oregon DEQ
     Waste Management & Cleanup Division
     Attn: Hazardous Waste Forms Clerk
     811 SW 6th Ave.
     Portland, OR 97204-1390

8. Do NOT count this waste toward your "normal" hazardous waste generator category.

9. Do NOT report this waste on your Annual Hazardous Waste Reporting Form.

How Should I Manage This Abandoned Hazardous Waste?

Abandoned hazardous waste should be managed according to the standards appropriate to the quantity of hazardous waste abandoned. If the quantity of abandoned waste is:

- 220 pounds or less, you may store it for as long as you need, no time limit exists. Waste may be managed at a permitted solid waste facility that will accept hazardous waste, or hazardous waste TSDR facility.

- 220 pounds to 2200 pounds, you may store it up to 180 days (270 days if waste will be shipped greater than 200 miles). Wastes must be managed at a facility permitted to accept conditionally exempt quantities of hazardous waste or at a permitted hazardous waste TSDR facility.

  NOTE: (Persons who have up to 2200 pounds of abandoned hazardous waste , may be eligible to dispose of their hazardous waste for a fee at the "METRO" hazardous waste collection facility in

Portland OR. Contact METRO at (503) 234-3000 for participation information.

- 2200 pounds or greater, you may store it up to 90 days. Wastes must be managed at a permitted hazardous waste TSDR facility.

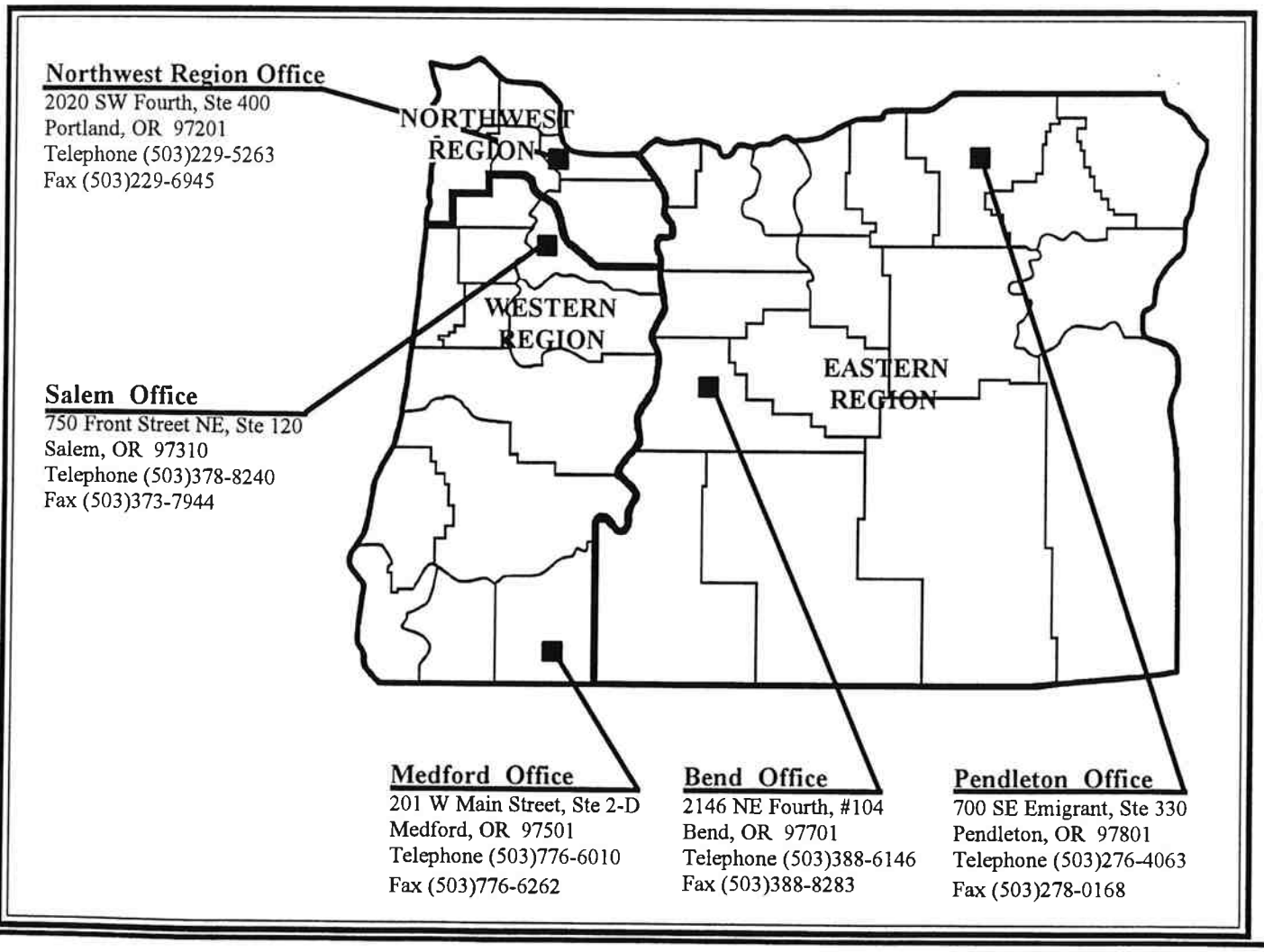
Note that the management standards for abandoned waste are independent of your regular hazardous waste generator category.

In general, abandoned hazardous waste should be stored in a secure area. Containers should be closed, in good condition (not leaking or distorted), labelled with the words "Hazardous Waste", and marked with the date that the waste was found (the "accumulation start" date). While in storage, containers should be inspected weekly to ensure that these standards are met.

How Can I Get In Touch With The Department Of Environmental Quality?

The map shows the location of the DEQ regional offices that can be contacted for more information on how to deal with abandoned hazardous waste.

DEQ regional and branch offices are located in three regions in Oregon.



REQUEST FOR FEE RELIEF FOR ABANDONED HAZARDOUS WASTE

To be considered for fee relief, ALL requested information must be provided.

Name of Reporter _____
Company Name _____
Street Address _____ City _____ Zip _____
Telephone # _____
Who did you contact at DEQ? _____
When did you contact DEQ? _____

DEQ/EPA Identification # O R ☐☐☐☐☐☐☐☐☐☐

Generator status at time of discovery of abandoned hazardous waste
☐ LQG ☐ SQG ☐ CEG ☐ Not a Generator

Address/location where abandoned hazardous waste was found: _____
_____

Date abandoned hazardous waste was found: _____

Describe circumstances of how you found the abandoned hazardous waste.
_____
_____
_____
_____

Describe condition of containers holding waste. _____
_____

Was waste released, spilled, etc. to the environment? ☐ Yes ☐ No

Describe attempts you made to locate the owner of the waste. (Please detail agencies, sheriff, companies, etc. you contacted. Attach additional sheets if necessary.)
_____
_____
_____
_____
_____

Was this abandoned hazardous waste shipped off-site under manifest? ☐ Yes ☐ No
If NO, Who was the contractor? _____
Who was the transporter? _____

Have you found abandoned hazardous waste at this site before? ☐ Yes ☐ No

Please describe last incident. _____
_____
_____
_____

Quantity: _____ Location: _____ Date: _____

Over . . .

ABANDONED HAZARDOUS WASTE DESCRIPTION

	Hazardous Waste Codes*	Quantity	Unit*	Form			Management System Code*	Name & EPA I.D. of Facility that will or has received the Hazardous Waste
				Liquid	Solid	Gas		
1								
2								
3								
4								
5								

* If you are unfamiliar with Hazardous Waste Codes or Management System Codes request a copy of "Hazardous Waste Reference Guidebook" from your DEQ regional office.

◆ Units: P= pounds; K= kilograms; G= gallons; L= liters; C= cubic yards.

I am not the generator of the waste described herein, and have no knowledge of the generator or owner of the waste. I have managed the waste according to applicable hazardous waste regulations. The information submitted in this document is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Signature: _____ **Date:** _____

Title: _____

Mail completed forms to:

1. DEQ Regional Office
2. Hazardous Waste Forms Clerk
   Oregon DEQ
   Waste Management & Cleanup Division
   811 SW 6th Ave.
   Portland, Oregon 97204-1390

DEQ Use Only

Request For HW Fee Relief
☐ APPROVED ☐ DENIED
Reason for Denial _____
_____
BY _____

APPENDIX I

COPIES OF SELECTED FEDERAL ENVIRONMENTAL GUIDANCE

I1. Waste Derived Fertilizer (EPA Fact Sheet)
I2. EPA Region 9 Preliminary Remediation Goals (PRGs)

United States
Environmental Protection
Agency

Solid Waste and
Emergency Response
(5305W)

EPA530-F-97-053
December 1997
http://www.epa.gov

Office of Solid Waste

EPA Environmental Fact Sheet

Waste-Derived Fertilizers

Concerns have been raised regarding the use of certain wastes in the manufacture of agricultural fertilizers and soil amendments, and the potential for ecological or human health risks, as well as crop damage, when such fertilizers are applied to farmlands. In conjunction with state governments, the U.S. Environmental Protection Agency (EPA) has launched a major effort to assess whether or not contaminants in fertilizers may be causing harmful effects, and whether additional government actions to safeguard public health and the environment may be warranted.

Wastes Used in Fertilizers

Most fertilizers that are commonly used in agriculture contain the three basic plant nutrients: nitrogen, phosphorus, and potassium. Some fertilizers also contain certain "micronutrients," such as zinc and other metals, that are necessary for plant growth. Materials that are applied to the land primarily to enhance soil characteristics (rather than as plant food) are commonly referred to as soil amendments.

Fertilizers and soil amendments can be derived from virgin raw material, composts and other organic matter, and wastes, such as sewage sludge and certain industrial wastes. These wastes can include some that are regulated as hazardous under state and federal regulations.

Industrial waste materials are often used in fertilizers as a source of zinc and other micronutrient metals. Current information indicates that only a relatively small percentage of fertilizers is manufactured using industrial wastes as ingredients, and that hazardous wastes are used as ingredients in only a small portion of waste-derived fertilizers. Some fertilizers and soil amendments that are not derived from waste materials can nevertheless contain measurable levels of heavy metals such as lead, arsenic, and cadmium.

EPA's longstanding policy encourages the beneficial reuse and recycling of industrial wastes, including hazardous wastes, when such wastes can be used as safe and effective substitutes for virgin raw materials. Although EPA is examining whether some fertilizers or soil conditioners may contain potentially harmful levels of contaminants, the Agency believes that some wastes can be used beneficially in

fertilizers when properly manufactured and applied.

Fertilizer Regulations

While a number of states currently have testing and labeling requirements for fertilizers, such requirements typically address only the agriculturally beneficial (e.g., plant food) ingredients of the fertilizers. Relatively few states require comprehensive testing and disclosure of all chemical components of fertilizers. As a general rule, soil amendments are subject to fewer state regula-tory controls than are fertilizers.

Certain types of wastes that are used for agricultural purposes are subject to federal regulations, which are often administered by states. Sewage sludges that are used in agriculture are regulated under the Clean Water Act, and are currently subject to concentration limits for the metals arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc. In addition, for fertilizers that contain hazardous waste, EPA standards specify limits on the levels of heavy metals and other toxic compounds that may be contained in the fertilizer products. These concentration limits were based on the "best demonstrated available technology" for reducing the toxicity and mobility of the hazardous constituents. However, fertilizer made from one specific type of hazardous waste-air pollution control dust generated during steel manufacturing-is not subject to those concentration limits. This exemption was based on a 1988 finding by EPA that the composition of this particular waste is comparable to the materials that would otherwise be used to make this type of fertilizer, and that its typical use was not harmful. All other fertilizers that contain hazardous wastes are, however, subject to the contaminant concentration limits established by EPA.

In some states, the regulations on hazardous waste use in fertilizers may be more stringent than the federal standards, since states can adopt regulations that are more stringent and/or broader in scope than the federal regulations. Likewise, some states may regulate the use of nonhazardous wastes in fertilizers, although such practices are not currently subject to regulation at the federal level.

Actions Being Taken by EPA

To determine whether contaminants in fertilizers (both waste-derived and nonwaste-derived) may pose unacceptable risks to human health or the environment, EPA is currently assessing: (1) the types of wastes that are being used in fertilizer manufacture, and the composition of fertilizers with regard to toxic metals and other potentially hazardous constituents; (2) the potential for soil contamination, and associated risks to human health and the environment, from nonbeneficial constituents, based on fertilizer content and application rates; (3) incidents of crop damage or other problems thought to be related to waste-derived fertilizer use or fertilizer containing hazardous constituents; (4) current regulatory requirements for fertilizer composition in various states and in foreign countries.

Since the American Pacific Northwest has been the focus of many concerns regarding waste-derived fertilizers, EPA's Region 10 office is the lead federal organization working with Washington and other states to coordinate state and federal efforts in this area. Region 10 is an active participant in the Washington State Fertilizer Advisory Workgroup, and will be assisting the state in conducting further field studies and research on contaminants in fertilizers in the state of Washington.

EPA will carefully review all collected information to determine the nature and magnitude of the problem, if any. Based on the outcome of this investigation, EPA will consult with the U.S. Department of Agriculture (USDA) to determine whether additional actions beyond current regulations are necessary to protect public health and the environment, and/or agricultural land resources. Any such actions also will be done in consultation with the states, in order to complement and reinforce state efforts underway. Although it is not clear at this time that additional government action will be needed, possible actions that could be taken by EPA or the states include: (1) issuing guidance or regulations on labeling of fertilizer ingredients; (2) further restricting the use of hazardous waste in fertilizers; or (3) issuing comprehensive new regulations for contaminants in all fertilizers and soil conditioners.

When the Agency completes its initial assessment of available data on contaminants in fertilizers, it will identify data gaps and determine what further information is needed. As new information becomes available, EPA will continue to provide updates on its activities and findings related to the use of fertilizers.

For More Information

This fact sheet is available in electronic format on the Internet at http://www.epa.gov/oswer/hazwaste. For additional information or to order copies of this or any other document, call the RCRA Hotline. Callers within the Washington Metropolitan Area must dial 703-412-9810 or TDD 703-412-3323 (hearing impaired). Long-distance callers may call 1-800-424-9346 or TDD 1-800-553-7672. The RCRA Hotline operates weekdays, 9:00 a.m. to 6:00 p.m. Write to the RCRA Information Center (5305W), US EPA, 401 M Street, SW, Washington, DC 20460.

Within Region 10, you may contact Dave Bartus at (206) 553-2804, or via e-mail, at bartus.dave@epamail.epa.gov.

For information about state activities, please contact one of the following individuals:

In Washington, contact:
Chris Chapman, at (360) 407-7160

In Oregon, contact:
Gary Calaba, Oregon Department of Environmental Quality, at (503) 229-6534
Hersch Pendell, Oregon Department of Agriculture, at (503) 986-4752

In Idaho, contact:
Michael Gregory, Idaho Department of Environmental Quality, at (208) 373-0502
Beth Williams, Bureau of Agrichemical Standards, at (208) 332-8602

EPA Region 9 [illegible] ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	AM TAP WATER	CAS No.	CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		SOIL SCREENING LEVEL Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
									0.10			Polynuclear aromatic hydrocarbons (PAHs)										
		###	i			6.0E-02	r	1	0.10	# ## ## #	83-32-9	Acenaphthene	1.1E+02	sat	1.1E+02	sat	2.2E+02	nc	3.7E+02	nc	5.7E+02	2.9E+01
		###	i			3.0E-01	r	1	0.10	# ## ## #	120-12-7	Anthracene	5.7E+00	sat	5.7E+00	sat	1.1E+03	nc	1.8E+03	nc	1.2E+04	5.9E+02
###	n			###	r			0	0.10	# ## ## #	56-55-3	Benz[a]anthracene	6.1E-01	ca	2.6E+00	ca	9.2E-03	ca'	9.2E-02	ca	2.0E+00	8.0E-02
###	n			###	r			0	0.10	# ## ## #	205-99-2	Benzo[b]fluoranthene	6.1E-01	ca	2.6E+00	ca	9.2E-03	ca	9.2E-02	ca	5.0E+00	2.0E-01
###	n			###	r			0	0.10	# ## ## #	207-08-9	Benzo[k]fluoranthene	6.1E+00	ca	2.6E+01	ca	9.2E-02	ca	9.2E-01	ca	4.9E+01	2.0E+00
												"CAL-Modified PRG" (PEA, 1994)	6.1E-01									
												PAHs continued										
###	i			###	r			0	0.10	# ## ## #	50-32-8	Benzo[a]pyrene	6.1E-02	ca	2.6E-01	ca	9.2E-04	ca	9.2E-03	ca	8.0E+00	4.0E-01
												"CAL-Modified PRG" (PEA, 1994)							1.5E-03			
###	n			###	r			0	0.10	# ## ## #	218-01-9	Chrysene	7.2E+00	sat	7.2E+00	sat	9.2E-01	ca	9.2E+00	ca	1.6E+02	8.0E+00
												"CAL-Modified PRG" (PEA, 1994)	6.1E+00									
###	n			###	r			0	0.10	# ## ## #	53-70-3	Dibenz[ah]anthracene	6.1E-02	ca	2.6E-01	ca	9.2E-04	ca	9.2E-03	ca	2.0E+00	8.0E-02
		###	i			4.0E-02	r	0	0.10	# ## ## #	206-44-0	Fluoranthene	2.6E+03	nc	2.7E+04	nc	1.5E+02	nc	1.5E+03	nc	4.3E+03	2.1E+02
		###	i			4.0E-02	r	1	0.10	# ## ## #	86-73-7	Fluorene	9.0E+01	sat	9.0E+01	sat	1.5E+02	nc	2.4E+02	nc	5.6E+02	2.8E+01
###	n			###	r			0	0.10	# ## ## #	193-39-5	Indeno[1,2,3-cd]pyrene	6.1E-01	ca	2.6E+00	ca	9.2E-03	ca	9.2E-02	ca	1.4E+01	7.0E-01
		###	n			4.0E-02	r	1	0.10	# ## ## #	91-20-3	Naphthalene	2.4E+02	sat	2.4E+02	sat	1.5E+02	nc	2.4E+02	nc	8.4E+01	4.0E+00
		###	i			###	r	1	0.10	## ## #	129-00-0	Pyrene	1.0E+02	sat	1.0E+02	sat	1.1E+02	nc	1.8E+02	nc	4.2E+03	2.1E+02
###	i	###	i	1.5E-01	r	9.0E-03	r	0	0.10	# ## ## #	67747-09-5	Prochloraz	3.0E+00	ca	1.3E+01	ca	4.5E-02	ca	3.3E+02	ca		
		###	n			6.0E-03	r	0	0.10	# ## ## #	26399-36-0	Profluralin	3.9E+02	nc	4.1E+03	nc	2.2E+01	nc	2.2E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	1610-18-0	Prometon	9.8E+02	nc	1.0E+04	nc	5.5E+01	nc	5.5E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	7287-19-6	Prometryn	2.6E+02	nc	2.7E+03	nc	1.5E+01	nc	1.5E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	23950-58-5	Pronamide	4.9E+03	nc	5.1E+04	nc	2.7E+02	nc	2.7E+03	nc		
		###	i			###	r	0	0.10	# ## ## #	1918-16-7	Propachlor	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	709-98-8	Propanil	3.3E+02	nc	3.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	2312-35-8	Propargite	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	107-19-7	Propargyl alcohol	1.3E+02	nc	1.4E+03	nc	7.3E+00	nc	7.3E+01	nc		
		###	i			###	r	0	0.10	# ## ## #	139-40-2	Propazine	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	122-42-9	Propham	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	60207-90-1	Propiconazole	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc		
		###	h			###	r	0	0.10	# ## ## #	57-55-6	Propylene glycol	1.0E+05	max	1.0E+05	max	7.3E+04	nc	7.3E+05	nc		
		###	n			###	r	0	0.10	# ## ## #	111-35-3	Propylene glycol, monoethyl ether	4.6E+04	nc	1.0E+05	max	2.6E+03	nc	2.6E+04	nc		
		###	h			###	i	0	0.10	# ## ## #	107-98-2	Propylene glycol, monomethyl ether	4.6E+04	nc	1.0E+05	max	2.1E+03	nc	2.6E+04	nc		
###	i	8.6E-03	r	###	i	###	i	1	0.10	# ## ## #	75-56-9	Propylene oxida					5.2E-01	ca	2.2E-01	ca		
		###	i			2.5E-01	r	0	0.10	# ## ## #	81335-77-5	Pursuit	1.6E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		###	i			###	r	0	0.10	# ## ## #	61630-58-1	Pydrin	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	110-86-1	Pyridine	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc		
		###	i			###	r	0	0.10	# ## ## #	13593-03-8	Quinalphos	3.3E+01	nc	3.4E+02	nc	1.8E+00	nc	1.8E+01	nc		
###	h			1.2E+01	r			0	0.10	# ## ## #	91-22-5	Quinoline	3.7E-02	ca	1.6E-01	ca	5.6E-04	ca	5.6E-03	ca		
###	i	###	i	###	r	###	r	0	0.10	# ## ## #	121-82-4	RDX (Cyclonite)	4.0E+00	ca*	1.7E+01	ca	6.1E-02	ca	6.1E-01	ca		
		###	i			###	r	0	0.10	# ## ## #	10453-86-8	Resmethrin	2.0E+03	nc	2.0E+04	nc	1.1E+02	nc	1.1E+03	nc		
		###	h			###	r	0	0.10	# ## ## #	299-84-3	Ronnel	3.3E+03	nc	3.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
		###	i			###	r	0	0.10	# ## ## #	83-79-4	Rotenone	2.6E+02	nc	2.7E+03	nc	1.5E+01	nc	1.5E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	78578-05-0	Savey	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc		
		###	i					0	0.10	# ## #	7783-00-8	Selenious Acid	3.3E+02	nc	3.4E+03	nc			1.8E+02	nc		
		###	i					0	0.01	# ## #	7782-49-2	Selenium	3.8E+02	nc	8.5E+03	nc			1.8E+02	nc	5.0E+00	3.0E-01
		###	h					0	0.10	# ## #	630-10-4	Selenourea	3.3E+02	nc	3.4E+03	nc			1.8E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	74051-80-2	Sethoxydim	5.9E+03	nc	6.1E+04	nc	3.3E+02	nc	3.3E+03	nc		
		###	i					0	0.01	# ## #	7440-22-4	Silver and compounds	3.8E+02	nc	8.5E+03	nc			1.8E+02	nc	3.4E+01	2.0E+00
###	h	###	i	###	r	###	r	0	0.10	# ## ## #	122-34-9	Simazine	3.7E+00	ca*	1.6E+01	ca*	5.6E-02	ca	5.6E-01	ca		
		###	i			###	r	0	0.10	# ## ## #	26628-22-8	Sodium azide	2.6E+02	nc	2.7E+03	nc	1.5E+01	nc	1.5E+02	nc		
###	h	###	i	###	r	###	r	0	0.10	# ## ## #	148-18-5	Sodium diethyldithiocarbamate	1.6E+00	ca	7.1E+00	ca	2.5E-02	ca	2.5E-01	ca		
		###	i			###	r	0	0.10	# ## ## #	62-74-8	Sodium fluoroacetate	1.3E+00	nc	1.4E+01	nc	7.3E-02	nc	7.3E-01	nc		
		###	h			###	r	0	0.10	# ## ## #	13718-26-8	Sodium metavanadate	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc		
		###	i					0	0.01	# ## #	7440-24-6	Strontium, stable	4.6E+04	nc	1.0E+05	max			2.2E+04	nc		
		###	i			###	r	0	0.10	# ## ## #	57-24-9	Strychnine	2.0E+01	nc	2.0E+02	nc	1.1E+00	nc	1.1E+01	nc		
		###	i			2.9E-01	i	1	0.10	# ## ## #	100-42-5	Styrene	6.8E+02	sat	6.8E+02	sat	1.1E+03	nc	1.6E+03	nc	4.0E+00	2.0E-01
		###	i			###	r	0	0.10	# ## ## #	88671-89-0	Systhane	1.6E+03	nc	1.7E+04	nc	9.1E+01	nc	9.1E+02	nc		
###	h			###	h			0	0.03	# ## ## #	1746-01-6	2,3,7,8-TCDD (dioxin)	3.8E-06	ca	2.4E-05	ca	4.5E-08	ca	4.5E-07	ca		
		###	i			###	r	0	0.10	# ## ## #	34014-18-1	Tebuthiuron	4.6E+03	nc	4.8E+04	nc	2.6E+02	nc	2.6E+03	nc		
		###	h			###	r	0	0.10	# ## ## #	3383-96-8	Temephos	1.3E+03	nc	1.4E+04	nc	7.3E+01	nc	7.3E+02	nc		
		###	i			###	r	0	0.10	# ## ## #	5902-51-2	Terbacil	8.5E+02	nc	8.9E+03	nc	4.7E+01	nc	4.7E+02	nc		
		###	h			###	r	0	0.10	# ## ## #	13071-79-9	Terbufos	1.6E+00	nc	1.7E+01	nc	9.1E-02	nc	9.1E-01	nc		
		###	i			###	r	0	0.10	# ## ## #	886-50-0	Terbutryn	6.5E+01	nc	6.8E+02	nc	3.7E+00	nc	3.7E+01	nc		
		###	i			###	r	0	0.10	# ## ## #	95-94-3	1,2,4,5-Tetrachlorobenzene	2.0E+01	nc	2.0E+02	nc	1.1E+00	nc	1.1E+01	nc		