



City of  
**Waukegan**

100 N. Martin Luther King Jr. Avenue  
Waukegan, Illinois 60085  
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(847) 599-2500

**Robert G. Sabonjian, Mayor**  
**Wayne Motley, City Clerk**  
**Dr. John R. Schwab, Treasurer**

September 22, 2009

Mr. Dusty Powell  
Senior Assistant County Administrator  
Lake County  
18 N. County Street  
Waukegan, Illinois 60085

RE: Brownfield Grant Intergovernmental Agreement between City of Waukegan and Lake County- Waukegan Harbor Slip 3 Re-Use Plan

Dear Mr. Powell:

The City of Waukegan is requesting a one year extension of the Intergovernmental Agreement dated October 31, 2008 to complete the Waukegan Harbor Slip 3 Re-Use Project as outlined in the City's Brownfield Grant Request dated August 29, 2008.

Since the award of the grant, significant progress has been made toward the completion of this project. In January 2009, the City obtained the necessary district court approvals as required by the settlement agreement regarding the Slip 3 containment cell. In July 2009, the City received the USEPA and IEPA approvals for the re-use plan in the Explanation of Significant Differences (ESD) as required by the EPA Superfund Record of Decision (ROD) document. Also in July, 2009, the Waukegan City Council authorized the solicitation for bids for the containment cell modifications.

If you have any questions regarding this request please call me at (847) 625-6827.

Sincerely,

Ron Laubach, P.E.  
Assistant City Engineer



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**Richard H. Hyde, Mayor**  
**Wayne Motley, City Clerk**  
**Patrick M. Dutcher, Treasurer**

August 29, 2008

Ms. Suzi Schmidt  
Chair  
Lake County Board  
18 North County Street  
10<sup>th</sup> Floor  
Waukegan, Illinois 60085

**Re: Request for Lake County Brownfield Fund Intergovernmental Effort  
Waukegan Lakefront--Waukegan Harbor Slip 3 Re-Use Plan**

Dear Ms. Schmidt:

The City of Waukegan requests the County's review of the following project for consideration for use of Lake County Brownfield Funds during this application period:

*Environmental Construction of Re-use Plan for Indoor  
Boat Storage on Former Harbor Slip 3 PCB Containment Cell  
Waukegan, IL  
Waukegan's North Harbor Redevelopment Area*

This application addresses the 13 points of information requested in the County's application guidance.

**1. Name of Local Government**

City of Waukegan  
100 N. Martin Luther King Jr. Ave.  
Waukegan, Illinois 60085

**Contact:**

John Moore, P.E.  
City Engineer  
Office 847-625-6854  
Facsimile 847-406-3141  
John.Moore@ci.waukegan.il.us

**2. Public/Private Partners in Project**

The City of Waukegan is highly engaged in an aggressive, well planned predevelopment phase for redevelopment of Waukegan's Lakefront. The Lakefront revitalization will have far-reaching

economic and environmental benefits for Waukegan and its neighboring municipalities, the County, and the region. Since the City adopted its Lakefront and Downtown Master Plan, we have seen considerable and effective progress in addressing environmental conditions in targeted redevelopment areas.

Waukegan Harbor, while serving certain industries, will see increased utilization in recreational and marina-related commercial uses. As Waukegan's lakefront redevelopment plan adds residential and commercial uses, the need for recreational boating and marina services has and will continue to increase. Several key harbor related projects are near implementation stage, including:

- The Waukegan Port District is securing financing for construction of floating docks and related improvements in its marina.
- The City of Waukegan and the Federal Economic Development Administration (EDA) will undertake the lowering of a water supply line that passes beneath the harbor.
- In June 2007, the City entered into Project Agreement with USEPA for Remedial Design of Harbor Dredging Project. Unfortunately, USEPA declined to sign the Project Agreement for the Environmental Dredge of Waukegan Harbor in the form proposed by the City. The City continues to work with its congressional delegation to find a solution to the harbor.

The City's existing marina operators are also key partners in this process. These important local businesses are striving to find compatible lakefront land areas for indoor and outdoor boat storage and maintenance services.

The County is an important partner in this effort. The City of Waukegan has made effective use of four prior County-sponsored Brownfield grants awarded in 2002, 2003, 2005, and 2007 for lakefront sites. The Phase II Environmental Site Assessment Report relating to the July 2005 County Brownfield Grant within the South Lakefront Development District was completed in May 2008. Of this original \$100,000 grant only \$25,000 was expended.

The City has informed and sought feedback and input from numerous stakeholders including government agencies, private developers, and the community using forums, town meetings, and public visioning sessions. This process will continue throughout the planning and redevelopment work efforts.

## **1. Narrative Description of Development/Redevelopment/Renovation Project**

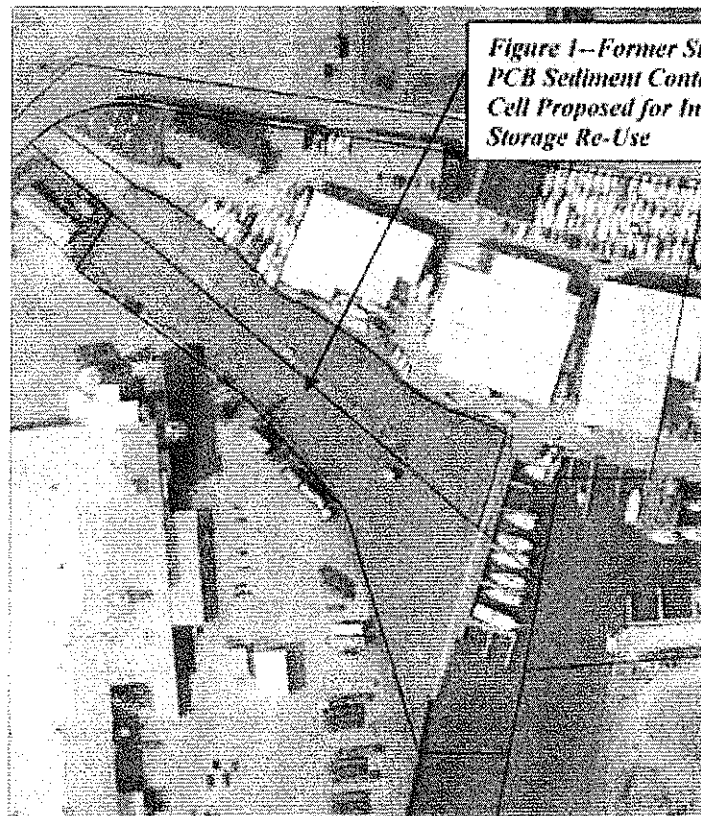
### ***Former Slip 3 Re-Use Plan for Indoor Boat Storage***

In 2005 the County awarded a Brownfield grant providing funding assistance to design and construct environmental containment improvements for an indoor boat storage facility on the former Slip 3 PCB containment cell. In September 2007 the City submitted a revised Basis of Design Memorandum for Alteration of Slip No. 3 Containment Cap -- Waukegan Harbor (to accommodate boat storage facility) for final approval by IEPA and USEPA (Attachment A). The revised Design addressed comments by USEPA dated 8/6/07 and IEPA dated 8/24/07 (see

attachments B and C). Legal counsel for the City and EPA are negotiating the final terms of an agreement that will authorize Larsen Marine to redevelop Slip 3 as a boat storage facility. The County's 2005 grant has been critical to these efforts.

During 1991 and 1992, PCB contaminated sediment from Waukegan Harbor was dredged as part of the Outboard Marine Corporation (OMC) Superfund Site work. During this prior project, dredged sediments were managed by thermal treatment (PCBs > 500 ppm) and via placement in a constructed containment cell (PCBs < 50 ppm). The dredged sediment having PCB concentrations between 50 and 500 ppm was placed within a containment unit constructed within the Waukegan Harbor's Boat Slip No. 3. Earlier USEPA documents refer to the Slip No.3 containment as a temporary measure, anticipated to be further addressed by OMC during further site wide remedial measures. In December 2000, OMC permanently closed its Waukegan Lakefront manufacturing plants, declared bankruptcy and has not sought re-organization.

Slip No. 3 was permanently isolated from the Inner Harbor by constructing a double-walled, braced, and soil-backfilled sheet pile cutoff wall around it. After the slip was isolated, a PCB-containment cell was built in the former slip by constructing an impermeable clay slurry wall with a minimum thickness of three feet around the slip with the slurry wall keyed 3.5 feet into the underlying clay till. Sediments from Slip No. 3 with PCB concentrations in excess of 500 ppm were removed from the former slip and treated on-site. The Upper Harbor was dredged and contaminated sediments removed to a 50 ppm PCB cleanup level. The dredged materials (50 to 500 ppm levels) were placed in the newly-constructed Slip No. 3 containment cell. A groundwater extraction well system was installed to maintain an inward hydraulic gradient.



*Figure 1—Former Slip No. 3  
PCB Sediment Containment  
Cell Proposed for Indoor Boat  
Storage Re-Use*

**Attachment D** presents engineering plans including two alternatives for developing a safe and protective re-use plan for the Slip 3 sediment containment cell area. This type of innovative re-use of this lakefront brownfield site and former disposal site places an underutilized, un-

developable parcel back into compatible, productive marina-related use. Attachment A also contains several drawings and renderings of the Slip 3 indoor boat storage re-use concepts and Engineer's Cost Estimates. As noted above, with the assistance of the 2005 County Grant the City has taken this concept to 90% level of design for final approval by EPA.

The County Brownfield Grant would specifically assist in conducting the following tasks for this Brownfield redevelopment site:

- Construct new engineered environmental containment features that would facilitate the subsequent boat storage facility construction. Brownfield Grant funds would not be utilized for civil, infrastructure, or boat storage building construction.

# 1. Anticipated Cost of Remediation/Cleanup Efforts

Table 1 defines the anticipated County Brownfield Grant work efforts and budget for re-use of the approximate 3-acre lakefront property.

**Table 1**  
**County Grant/Matching Expenditure Estimate**

Task	Estimated Cost:
Modify Slip 3 groundwater treatment/extraction system	\$ 28,000
Remove existing Slip 3 Cap	\$ 51,000
Disposal/relocation of surcharge below cap (3000 cy)	\$ 30,000
Off-site disposal of PCB-impacted surcharge as <50 ppm solid waste (300 cy)	\$ 13,500
Install new membrane cap & Drainage layer	\$ 167,250
Project/Construction Management	\$ 25,000
<b>Total Estimate</b>	<b>\$ 314,750</b>
<b>Matching/Contributing Funds</b>	<b>\$ 214,750</b>
<b>County Grant Request</b>	<b>\$ 100,000</b>

## 2. Total Project Costs

Total project costs for planning, designing and constructing an indoor boat storage facility on the former Slip 3 PCB containment cell are preliminarily estimated as outlined in Table 2.

*Table 2*  
*Preliminary Estimate of Total Project Costs*

Task	Units Installed	Cost
Remove Topsoil and Cover Sand	1,800 yd <sup>3</sup> topsoil 5,200 yd <sup>3</sup> sand	\$ 59,000
Remove Liner & Surcharge Sand <sup>1</sup>	10,300 yd <sup>3</sup> 14,000 tons	\$ 466,000
Install H-Piles & Tie Rods <sup>2</sup>	61 H-Piles 9 Tie-Rods	\$ 224,000
Piping, Well Vaults & Harbor Rock	2 vault (12 yd <sup>3</sup> TSCA) 300 tons	\$ 60,000
Install Grade Beams	210 yd <sup>3</sup> concrete (27 yd <sup>3</sup> TSCA)	\$ 87,000
Install Geogrid, Geonet & Liner	32,000 ft <sup>2</sup> grid 94,000 ft <sup>2</sup> net & liner	\$ 229,000
Earthwork & Place Stone	CA4 1,030 Tons CA6 3,775 tons	\$ 86,000
Concrete Slab & Asphalt Paving	1,520 yd <sup>3</sup> concrete 3,980 yd <sup>2</sup> asphalt	\$ 444,000
Restoration & Seeding	n/a	\$ 11,000
TOTAL		\$ 1,666,000
Engineering Oversight		\$ 42,000
Total with Oversight		\$ 1,708,000

## 3. Amount of County Brownfield Funds Requested

The City requests \$100,000 of County Brownfield Funds for this project.

## 4. Detail of Other Local Funds to be Used as Part of Project

The City will contribute TIF monies and/or Home Rule Sales Tax Revenue available for the Lakefront Redevelopment work. Property owner/developer contributions to the total project work are also anticipated.

## 5. State/Federal Funding

At present, State and Federal funding has not been granted for this project.

**6. Location of Property**

Figure 1 shows the location of the property. Slip 3 is located on Sea Horse Drive between Larsen Marine and National Gypsum.

**7. Listing of Contaminants**

Contaminants on the property are detailed in the "Basis of Design Memorandum (Attachment A), USEPA memorandum dated 8/6/2007 (Attachment B), and IEPA letter dated 8/24/2007 (Attachment C).

**8. Copies of Engineering Studies**

Attachment A provides the engineering study completed to date.

**9. County Funds to be Reimbursed if Provided for Phase I and/or II Studies and Project Completion is Not Finalized.**

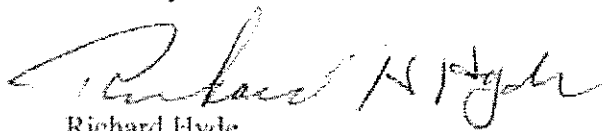
The City believes that this project will be completed and that such data collected by this project will be beneficial to the overall lakefront redevelopment.

**10. County Brownfield Funds to be Contributed on a Reimbursement Basis**

The City effectively manages several reimbursement-type grant programs and has a demonstrated proficiency in administratively tracking and documenting eligible reimbursement costs.

The City of Waukegan appreciates the County's careful review and consideration of this Brownfield Grant request. We would be pleased to discuss the project and answer any questions the County's Community & Economic Development Committee may have related to this Brownfield Grant request. Please do not hesitate to contact Ms. Robin Schabes at 847/856-6425

Sincerely,



Richard Hyde  
Mayor, City of Waukegan

Attachment A  
Attachment B  
Attachment C  
Attachment D

CC: Noelle Kischer, Planning Department  
R. Schabes, Director of Downtown & Lakefront Redevelopment  
J. Moore, City Engineer  
G. Gibson, Asst. County Administrator

## **Attachment A**

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### **Basis of Design Memorandum For Alteration of Slip No. 3 Containment Cap**



**Basis of Design Memorandum  
Alteration of Slip No. 3 Containment Cap  
Outboard Marine Corporation Superfund Site**

On June 23, 2005, the City of Waukegan (City) and the United States Environmental Protection Agency (USEPA) entered into a Supplemental Consent Decree in the matter of "United States of America, and People of the State of Illinois, Plaintiffs v. Outboard Marine Corporation, Defendant, and the City of Waukegan, Illinois, Defendant-Intervenor" (Civil Action No. 88-C-8571)("Supp. Consent Decree"). Under the Supp. Consent Decree the City assumed certain responsibilities for the operation and maintenance of three containment cells at the Outboard Marine Corporation (OMC) Superfund Site ("Site"). The Supp. Consent Decree also contemplated the City's exercise of an Option Agreement and the redevelopment of the Site consistent with remedial measures approved by USEPA. Paragraph 51 of the Supp. Consent Decree further provides that the City may lease portions of the Site to third parties. On September 30, 2005, by exercise of the Option Agreement, the City took title to the Site, including the portion of the Site contiguous to the Waukegan Harbor commonly known as "Slip No. 3".

The City at the time of entering into the Supp. Consent Decree and continuing afterwards has had discussions with Larsen Marine Service (Larsen) on the possibility of leasing Slip No. 3 from the City for the purpose of placing a dry rack storage facility near their existing marina operations at the north end of Waukegan Harbor. This Basis of Design Report addresses a conceptual design (30% design) for the construction of a 130-foot wide by 240-foot long dry rack storage building on top of the existing Slip No. 3 Containment on the west side of the current Larsen operation.

#### 1.0 Background

Prior to the remedial action at Waukegan Harbor (prior to 1989), Larsen operated their Marina business from Slip No. 3 the northernmost existing slip off the main harbor at Waukegan. Slip No. 3 was also the location of the outfall pipe from the Outboard Marine Corporations (OMC's) aluminum engine casting operation and contained more than 90% of the mass of polychlorinated biphenyls in Waukegan Harbor. Since complete removal of the sediments in Slip No. 3 was infeasible, a partial removal was completed for subsequent treatment to substantially reduce the mass. The residual PCB in Slip No. 3 along with the sediment from the upper Waukegan Harbor were enclosed in the Slip as a permanent contained location with protective barriers to prevent contact with ground water, surface water, and soil. This area is known as the Slip No. 3 Containment.

The construction sequence for the Slip No. 3 Containment included the following steps:

1. Slip No. 3 was isolated from the remainder of the Upper Harbor by constructing a double sheet pile wall (two walls twenty-feet apart) across the mouth of Slip No.

3. Picture #1 and backfilling the area between the two walls with a bentonite-sand mixture.
2. The sediment containing the largest part of the PCB mass (approximately 85%) in Slip No. 3 was removed for treatment on other parts of the OMC property, Picture #2.
3. A three foot wide soil-bentonite wall constructed from native sand at the site was installed along the northern, western and southern perimeters of Slip No. 3 and tied into the backfill between the two sheet pile walls across the mouth of the Slip, thus preventing the unrestricted interchange of ground water inside and outside of the containment area (the bottom of Waukegan Harbor is an impermeable glacial till formation known locally as the Chicago hardpan).
4. Approximately thirty thousand cubic yards of sediment (a silt and sand mix) was hydraulically dredged from the Upper Harbor and placed into Slip No. 3 (at completion of the dredging the sediment from the Upper Harbor filled Slip No. 3 to within two to three feet below ground surface, Picture #3).
5. A clean sand cover was spread on the sediment starting at the outside edge and progressing inward as the sediment consolidated and would support the sand cover, Picture #4. Once the sand cover extended across the entire surface of the slip at original grade, additional surcharge sand was moved on top of the cover to accelerate the consolidation of the sediment.
6. Two years after placing the surcharge cover, settlement was complete and the surcharge cover was graded to form the present topographic configuration of the Slip No. 3 containment.
7. A 60-mil HDPE liner, geogrid drain layer, protective geotextile, 18-inches of sand barrier layer and six-inches of topsoil was then placed over the contoured surcharge sand.
8. Two recovery wells were installed in the containment immediately after placement of the sand cover and have operated with a water treatment plant to keep the ground water elevation inside of the containment lower than the outside ground water level since completion of the containment in 1991.

The present topography of the Slip No. 3 Containment Cell is shown on Sheet 1 of 5, 30% Design Package.

During the hydraulic dredging operation, the sediment was deposited near the east end of Slip No. 3 and water was withdrawn for treatment near the west end of the containment. The dredging operation caused the sandier fraction of the sediment to be deposited in the east end of the containment near the double steel sheet pile cutoff wall with the finer organic silt in the west end of the containment.

The surcharge fill consolidated the deposited sediment until significant settlement was completed. An additional surcharge effect from dewatering the containment continues to secure the sediment.

The containment design for the cover that was placed over the graded surcharge sand was based on the following criteria in the approved Remedial Action Plan<sup>1</sup>:

1. The top of the containment cell will be at least 2-feet above the monthly mean 100-year lake level (40 CFR 761.75).
2. Containment cell cover design shall comply with the RCRA regulations, as outlined in 40 CFR 264.310.
3. A topsoil cover, if used, will be a minimum of 6-inches thick.
4. The slope of the cover will be between one and five percent.
5. The cover will have a surface drainage diversion system around the perimeter of the cap.
6. The drainage layer below the top of the cap will have a hydraulic conductivity of greater than  $1 \times 10^{-2}$  cm/sec.
7. If a topsoil cover is used, the drainage layer will be overlain by a filter media.
8. The bottom layer will be located two feet below ground surface and will have a slope of at least two percent.
9. The bottom layer will consist of a synthetic liner with a minimum of 40-mil thickness.

## 2.0 Proposed Alteration to Slip No. 3 Cap

Larsen proposes to install a 130-foot wide by 240-foot long dry rack boat storage building on top of Slip No. 3 containment for use in their Marina operations. The dry rack storage building would have a center aisle 55-feet wide with steel racks on each side of the aisle for storage of 30-35 foot long powerboats. The boat rack is likely to be tall enough to stack four boats (final decision to be made in later stage of the design). The building would be a steel frame building with the columns supported on spread footings and with a grade beam between the footings to carry the backside of the boat racks and the sidewall of the building. The steel racks that support the stacked boats would require another footing along the length of the building aisle. Typical pictures of a dry rack storage facility are shown on Picture 5.

The boats are taken in and out of the rack system using a large forklift truck capable of picking boats up to 20,000 pounds and with a boom that allows for placement in the water at up to -12 feet below grade. The forklift with the boat places a load on the dual wheel rear (non-steering) axle of the forklift that is equivalent to a loaded semi-truck (40,000 pounds). A picture of a typical forklift for dry rack storage is shown on Picture 5.

The property of Slip No. 3 is within the area of the 100-year flood elevation of the City and will have a floor slab elevation of 584 feet (NAD<sub>88</sub>). A plan view of the building on the Slip No. 3 site is shown on Sheet 2 of 5. The top of the steel sheet pile wall is at 584.5 feet (NAD<sub>88</sub>) and is approximately the same elevation as the proposed building floor slab. At the sheet pile wall the armor rock that was installed in 1991 to provide wave attenuation will be removed to elevation 571 feet (NAD<sub>88</sub>) at two locations to allow

<sup>1</sup> Canonic Environmental, "Appendix I-11, Design and Analysis Report", February 1991

for lowering of the boats into the water even at the lowest water levels ever recorded in Lake Michigan. The wave attenuation rock will be removed over a 100-foot wide and a 50-foot wide area to allow for multiple launching tie-off locations to facilitate launching and retrieval operations. The location of the launching and retrieval areas is shown on Sheet 2 of 5. A cross-section of the wall showing the wave attenuation rock that will be removed is shown on Sheet 3 of 5.

An analysis of the stability of the sheet pile walls that contain Slip No. 3 is included in Appendix A. The wall, under the present conditions and without the slide resisting effects of the toe rock, is adequate for the structural system of the front wall face and the tieback system. The stresses in the sheet pile wall are well below the allowable stresses for steel bulkhead design even without the toe rock.

An initial analysis of a likely building support system is based on the sediment and sand cover classifying as loose sand. The analysis is also based on an assumed perimeter column load of 100,000 pounds per column and a boat rack with 20,000-pound boats stacked four high. A seven-foot square spread footing keeps the bearing pressure at less than 2000 pounds per square foot the prescribed load for loose sand as specified in the 2003 International Building Code. The rack footing closest to the aisle would spread its load to a grade beam with a three foot wide footing to maintain a similar bearing capacity. A preliminary estimate of settlement indicates that the immediate settlement when the load is added could be up to 1/2 inch (the load would consist of the racked boats and snow load on the roof). Based on preliminary analysis, the foundation on the drawings are shown as spread footings bearing on the ground at 42-inches below grade for frost protection and with a grade beam between columns to carry the load of the sidewalls and the boat rack. The preliminary analysis of the bearing capacity and settlement are enclosed in Appendix A.

To investigate the soil conditions under the building, a sampling program is proposed to collect information on the density and characteristics of the consolidated sediment at a location on the east and west ends of the proposed building. Each soil boring will be advanced continuously from just below the existing HDPE liner until contact with the glacial till and will be sampled to determine density, water content, and grain size. The sampling plan is presented in Appendix B. Soil sampling for the areas of the Slip No. 3 containment outside of the original Slip No. 3 sheet pile wall are not proposed, since many soil borings were taken in this area during design of the soil-bentonite wall and are available for use in design of the building footings.

After completing the soil-sampling program, the conceptual footing design shown on the drawings will be modified to support the building loads. If settlement of a spread footing is too great in the areas of sediment fill to meet the tolerance requirements for the building and storage rack system, the footings may have to be supported on displacement piles (H-piles or open end pipe piles) that do not bring sediment to the surface.

The area to the west of the proposed building would be developed as a gravel yard area for surface storage of boats during the off-season and parking during the boating season.

The area would maintain a pitch centered on the entrance to the rack storage building at 584.5 that will allow the liner on top of the Slip No. 3 containment to slope at the minimum slope towards the soil-bentonite walls on either side of the containment.

The recovery wells will remain at their present locations with the well top elevation lowered into a concrete vault at each location. The vault will be designed to sustain the load of the operations in the dry-rack storage building with the cast-iron lid highway load rated to support the loaded forklift. The electric and piping in the vaults will be rerouted under the new liner to a new treatment plant location near the power source at the west end of the containment. Electric power to the well vaults will be above the new liner system and clean water from the treatment plant will discharge through a new pipe to CB-A at the upstream end of the perimeter drainage system. The locations of these features and the plan for the well vault are shown on Sheet 2 of 5 and Sheet 4 of 5.

The new HDPE liner/drainage grid/geotextile cover will be installed to slope from the center of the altered slip sand cover to the soil-bentonite wall top at a consistent slope of approximately 2%. Within the building footprint, there will be no liner. The building system will perform the infiltration limiting effects of the liner. The HDPE liner will be attached to the building at the perimeter grade beam with a stainless steel batten strip, as shown on Sheet 4 of 5.

Larsen may wash the hulls of the boats prior to racking the boats. The plan shows a series of floor drains for the purpose of capturing the wash water. Since these drains will be under the floor without the benefit of underlying liner, the conceptual design is to double enclose the drain lines with the discharge to the storm drainage system. Larsen will also install electric, water and natural gas service to the building. The electric and natural gas will be installed above the liner with the water service installed in a sleeve below the liner to maintain freeze protection for the water supply.

### 3.0 Investigation of the Sand Cover

The alteration of the cap of the Slip No. 3 Containment to allow for placement of the boat dry rack storage facility should all occur within the surcharge sand that was placed above normal grade at the site. The sand was taken from a large stockpile of sand that was on the former GM coke plant site adjacent to the Upper Harbor. The source of the sand was a United State Army Corps of Engineers dredging program in the entrance channel of Waukegan Harbor (out in the Lake) that was completed in the early 1970's. It is expected that the sand may contain some PCB's at concentrations less than 1ppm, but not the same concentration as the sediment that was placed into the cell from the Upper Harbor (the sediment from the upper harbor included all of the sediment in the harbor with concentrations of PCB greater than 50ppm).

To confirm the PCB concentration of the sand cover and to verify that sediment will not be in the area that will be excavated to lower the cap on the containment cell, a series of soil cores will be collected and analyzed for PCBs. The sample locations are shown on

Sheet 2 of 5. The details of the sampling program and the sampling procedures are presented in Appendix B.

#### 4.0 Basis of Design

The basis of design for the alteration of Slip No. 3 containment for use as a dry rack boat storage facility is centered on four basic design parameters:

1. Provide a new cap that meets the original design criteria or provides equivalent function.
2. Provide a foundation support system for the dry rack storage building that will meet the load and settlement criteria without removal of the sediment from the containment.
3. Identify the surcharge/cover sand as a separate material from the sediment and keep alterations in the surcharge/cover sand or above, including building foundations.
4. Maintain the integrity of the existing recovery well, treatment system and water level monitoring system

#### 4.1 Cap design criteria

The altered Slip No. 3 containment will directly meet most of the previous cap design criteria. The major variation is the use of the building envelope to perform as the upper impermeable liner under the building footprint. The building provides a dual envelope; with the building roof shedding rainwater to down drains that will be directly piped to the perimeter storm water drain system. The floor slab of the building acts as the secondary envelope to prevent surface water from entering the containment. The floor slab will be constructed using PVA additive in the concrete to reduce shrinkage and temperature cracking of the floor slab. If an expansion cold joint has to be incorporated into the final design of the floor slab, the joint will be placed on the high point in the floor drain slope and will be sealed with a waterproof mastic compound.

Compliance with the original design criteria are presented in Table I

Table I  
Cap Design Criteria

Design Criteria	Means of Compliance
Cap 2-feet above 100-year mean lake level	Low point of cap liner to remain at present elevation on the top of the soil-bentonite wall
Compliance with RCRA regulations	Building provides equivalent permeability less than or equal to the permeability of the bottom liner (glacial till). It also provides long-term minimization of migration of liquids through the closed containment and

	will function with minimum maintenance and will be resistant to erosion and abrasion.
6-inches of topsoil cover where required	Most of the topsoil cover will be removed and replaced with gravel or paved surfaces
Slope of 1-5%	Slope of liner will be 1-2% minimum on west end of containment
Surface drainage ditch around perimeter	Existing surface drainage and surface water storm drain around perimeter will remain in-place.
Drainage layer permeability $> 10^{-2}$ cm/sec	New drainage layer may consist of gravel fill over protective layer that provides drainage of full gravel layer with a permeability of more than $10^{-2}$ cm/sec
Drainage layer covered with filter layer	Topsoil likely used only around the edges of containment. Filter layer will be present.
Cover two feet below ground surface	To maintain slope cover over liner at center of containment on west end of containment may have 1.5 feet of cover (combined gravel and paving). However, cover will be drainable layer in its entirety, will not be subject to freeze-thaw, and will have a hard non-erosive surface layer.
Synthetic liner at least 40-mil	Synthetic liner where used outside of building footprint will be 60-mil HDPE or LDPE.

#### 4.2 Foundation Support System

The probable design criteria will be a settlement limitation of  $\frac{1}{2}$  inch differential settlement between footings for a light steel frame structure supporting the loads of snow and stored boats. The floor slab and outside flatwork concrete for the forklift operation will be designed to support an AASHTO H-20 loading (the loading from a semi-truck). The slab will be 6-8 inches thick with appropriate reinforcing and will bear on a gravel sub base layer that will also act as the drain layer for the cap (see above).

If test results from soil borings taken in the sediment indicate unacceptable settlement with only a spread footing bearing in the surcharge sand, an alternate foundation using displacement piles may have to be used on some of the footings.

#### 4.3 Separation of Surcharge/Cover Sand from Sediment

PCB content will identify the surcharge/cover sand. Sand removed from the surcharge/cover area will be managed in accordance with the requirements of the Illinois Environmental Protection Act. Sand having concentrations less than 1 ppm may be

reused on the Site with the concurrence of the Illinois Environmental Protection Agency (IEPA) and USEPA. Color content will be recorded during investigative sampling to determine if visual factors may be used to delineate the surcharge/cover sand from the underlying sediment.

The design testing will be supplemented during the implementation of the alteration to include additional testing to properly classify sand removed from below the original HDPE liner with the following expected classifications:

1. Less than 1 ppm PCB, may be eligible for reuse on the Site with the concurrence of IEPA and USEPA
2. Equal to or greater than one and less than 50ppm, disposal in a Subtitle D solid waste landfill.
3. Equal to or greater than 50ppm, disposal in a TSCA-approved landfill.

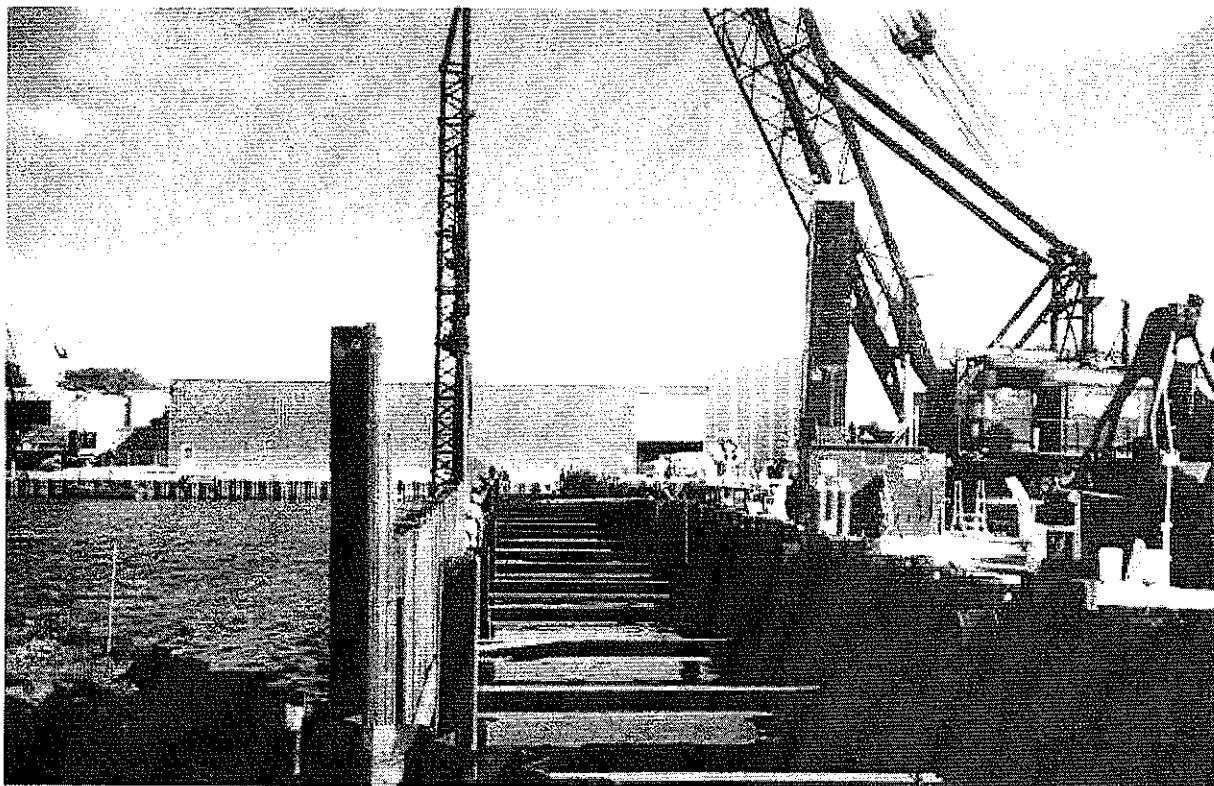
#### 4.4 Existing Recovery Well, Treatment and Monitoring System

Recovery well vaults will be designed to allow for safe, manned access with appropriate ventilation to access the electrical and piping in the vault. The vault will be designed for the AASHTO highway loadings including selection of a manhole that meets the H-20 load requirements.

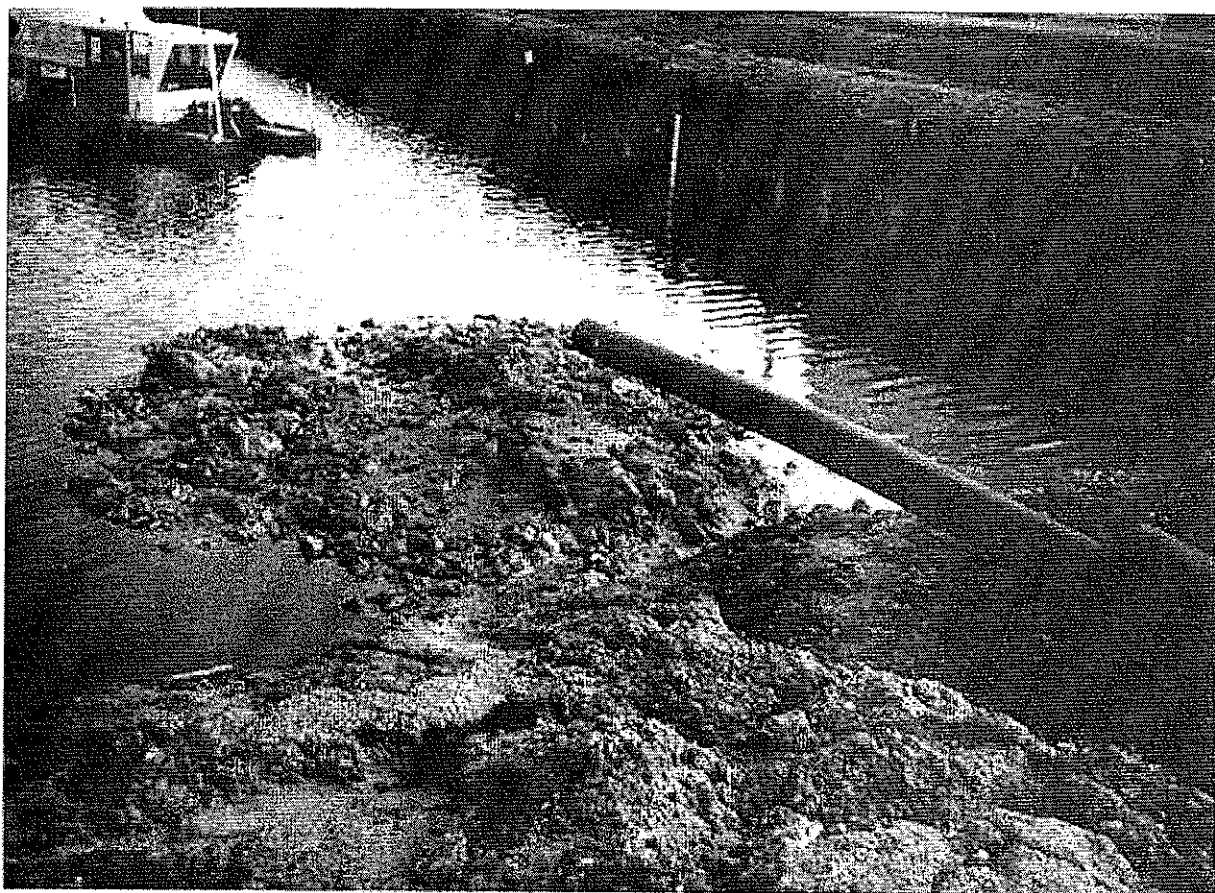
The treatment plant will be moved to the new location shown on Sheet 2 of 5 with a new floor drain discharge overflow into the containment area and a new power supply and drain line installed. Drainage of treated water will be to the storm sewer pipe on the south side of the containment cell. Pipes from the recovery well to the water treatment facility will be installed under the new HDPE liner and electrical will be installed over the top of the liner in the sub base/drainage layer.

Some of the piezometers and monitoring wells will be changed from exposed to flush-mount covers to allow for surface storage or parking uses of the altered Slip No. 3 cap. No other change is proposed for the water level and water quality monitoring system.





Photograph 1



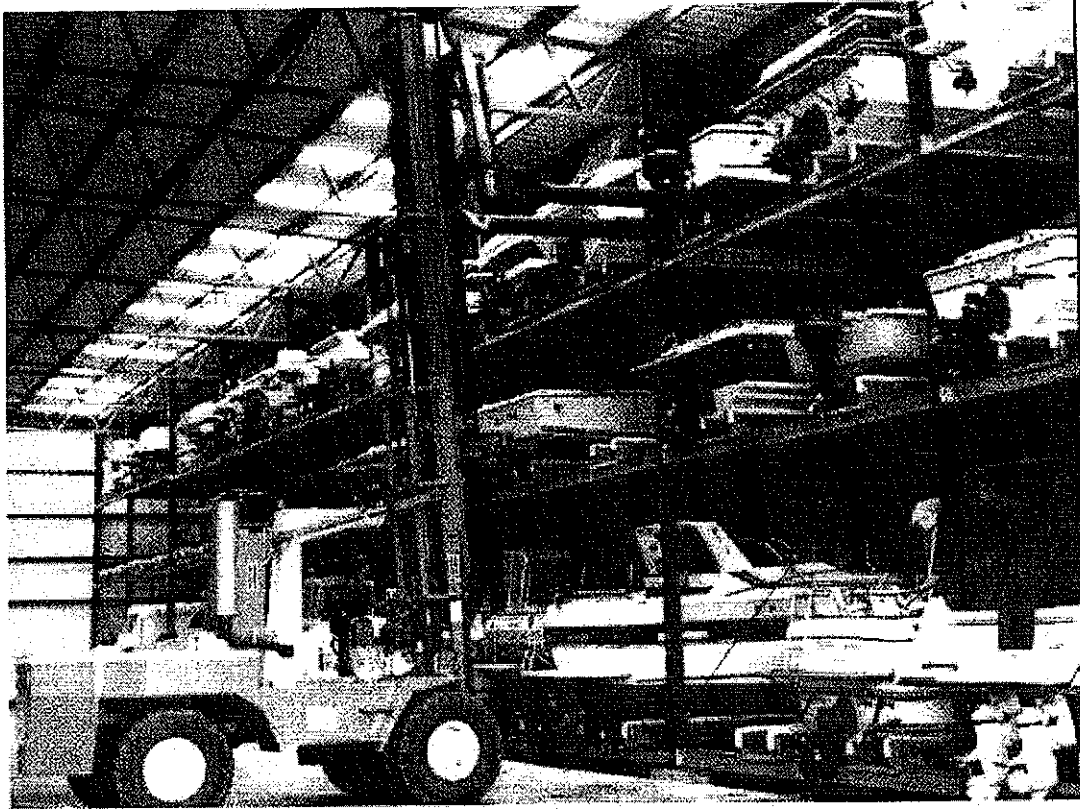
Photograph 2



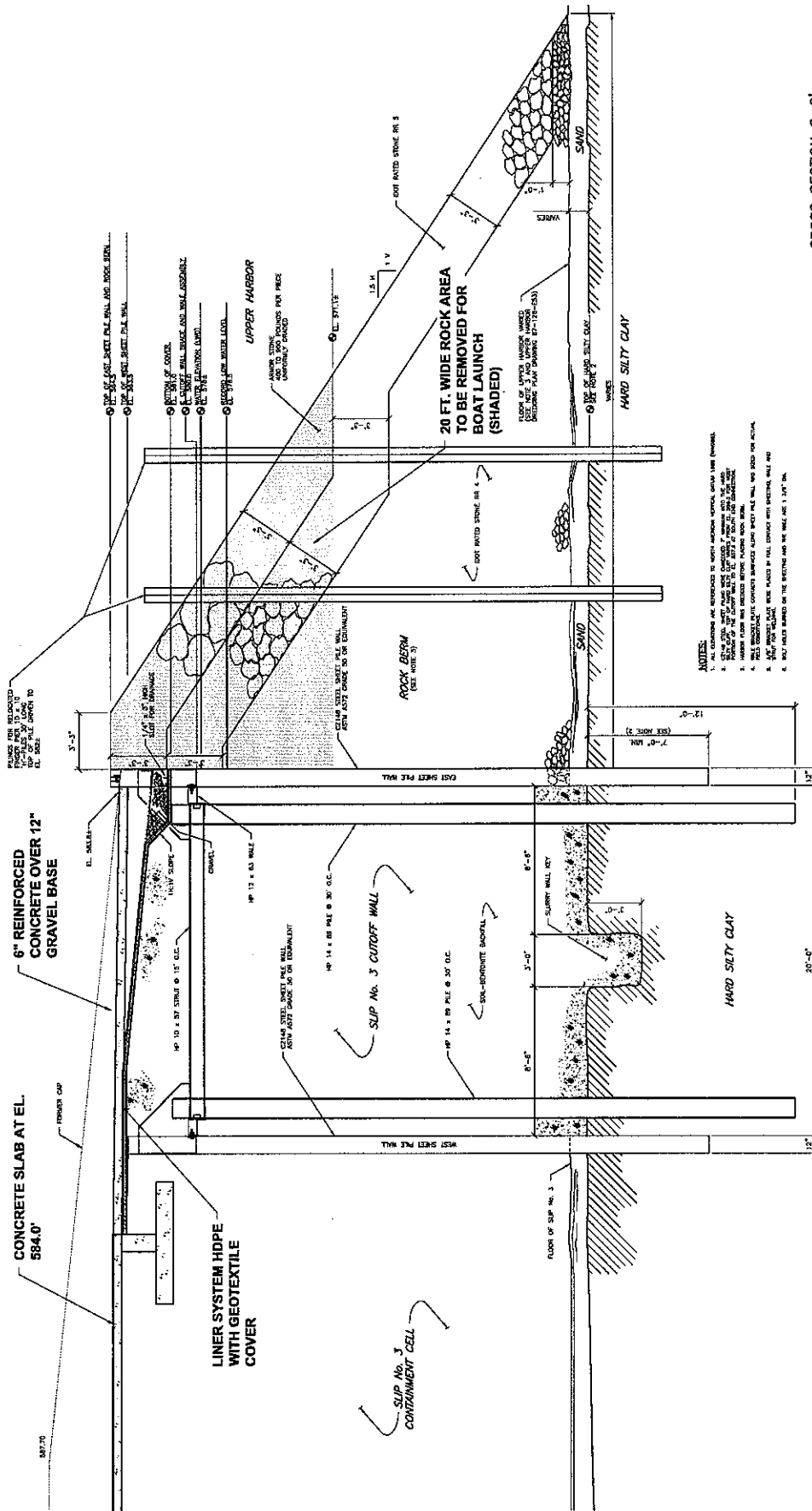
Photograph 3



Photograph 4



Photograph 5



CROSS SECTION C-C'  
SLIP No. 3 CONTAMINANT CELL ALTERATION  
PREPARED FOR  
CITY OF WAUKEGAN



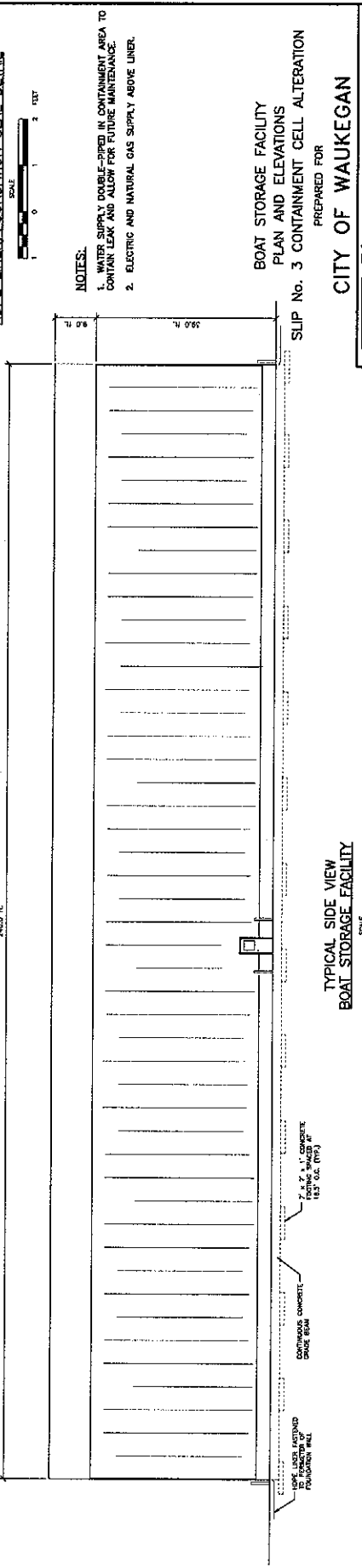
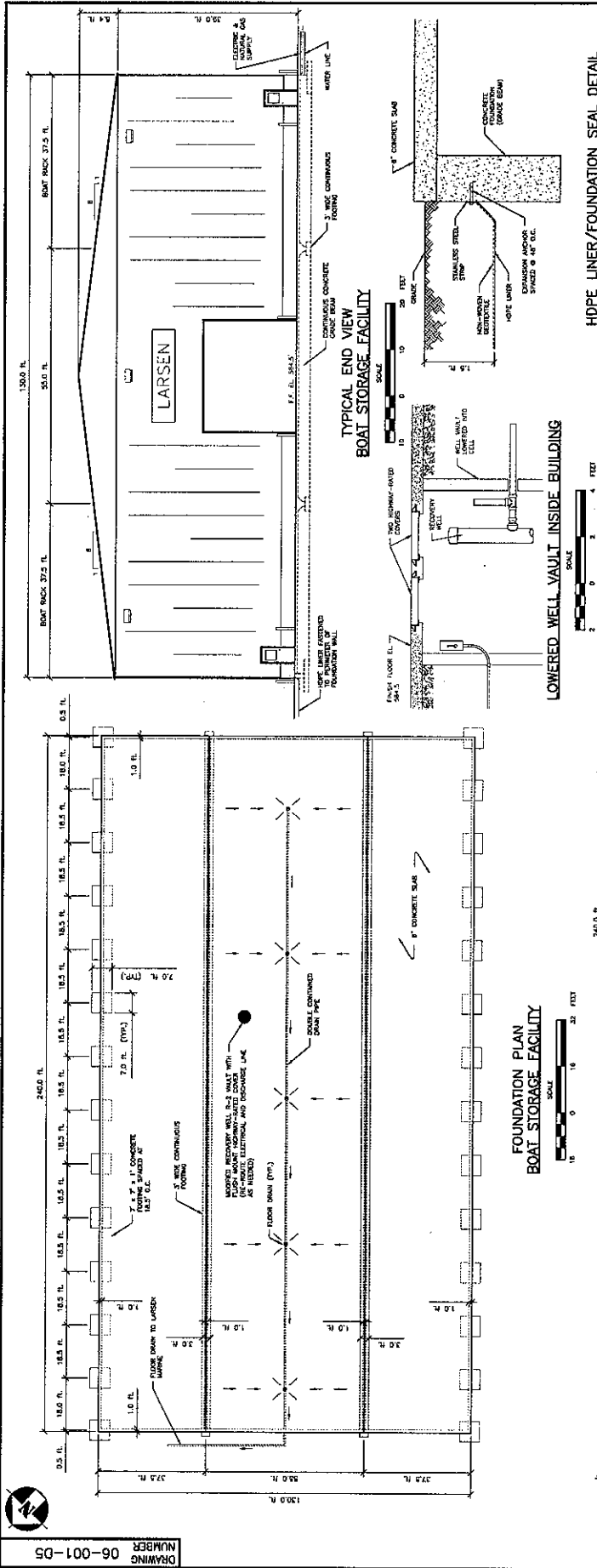
**Harrington Engineering & Construction, LLC**  
A  **HARD HAT SERVICES** Company

DATE:	04-20-06	SHEET 3 of 5	DRAWING NUMBER 06-001-03
SCALE:	AS SHOWN		

DRAWING NUMBER  
06-001-D3

REFERENCE:  
- CANCHIE ENVIRONMENTAL SERVICES CORP.,  
RECORD OF CONSTRUCTION DRAWING NO.  
87-128-FB4.

ISSUE / REVISION



**HARRINGTON ENGINEERING & CONSTRUCTION, LLC**  
A/BLAND HAT SERVICES COMPANY

1000 Broadway, Suite 1  
New York, New York 10001  
Phone: (212) 691-1111 Fax: (212) 691-1111

DATE: 05-03-08  
SCALE: AS SHOWN

**CITY OF WAUKEGAN**

BOAT STORAGE FACILITY  
PLAN AND ELEVATIONS  
SLIP No. 3 CONTAINMENT CELL ALTERATION  
PREPARED FOR

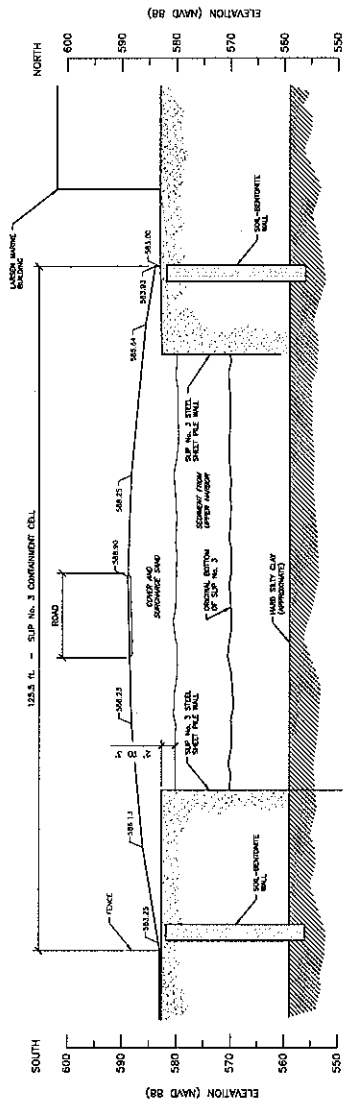
**ISSUE / REVISION**

No.	DATE	ISSUE / REVISION	BY	CHKD BY	APP'D BY
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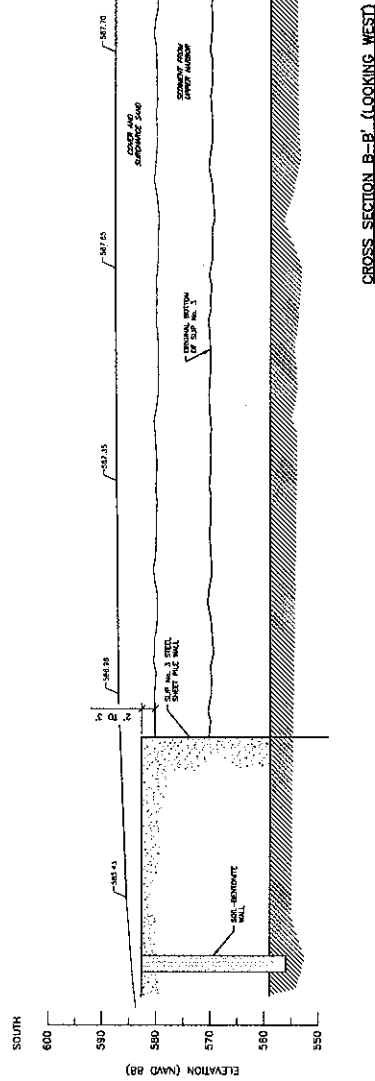
**SHEET 4 of 5**

**DRAWING NUMBER** 06-001-05

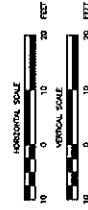
DRAWING NUMBER 06-001-D2



CROSS SECTION A-A' (LOOKING WEST)



CROSS SECTION B-B' (LOOKING WEST)



CROSS SECTION A-A AND B-B'  
SLIP No. 3 CONTAINMENT CELL ALTERATION  
PREPARED FOR

CITY OF WAUKEGAN



Harrington Engineering & Construction, LLC  
1800 Broadway, Suite 7  
Waukegan, IL 60087  
Phone: (815) 492-5000 Fax: (815) 492-5142

DATE: 04-20-06  
SCALE: AS SHOWN  
SHEET 5 of 5  
DRAWING NUMBER 06-001-D2

REVISIONS  
REVISION NO. 1  
DATE 07-12-04  
BY [Signature]  
CHECKED [Signature]  
APPROVED [Signature]

DATE	ISSUE / REVISION	BY	CHKD BY	APP'D BY

**Attachment B**

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Design addressed comments by USEPA  
Dated August 6, 2007

## ATTACHMENT B

MEMORANDUM

CH2MHILL

### Review of 90% Design - Slip 3 Containment Alteration/Boat Storage Re-Use OMC Plant 2, Waukegan, Illinois WA No. 018-RICO-0528, Contract No. EP-S5-06-01

TO: Kevin Adler/USEPA  
COPIES: Jewelle Keiser/CH2M HILL, Milwaukee  
FROM: Jim Schneider/CH2M HILL, Denver  
DATE: August 6, 2007  
PROJECT NUMBER: 348138.PR.01

This memorandum summarizes our review of the "90% Design Submittal" (dated June 2007) drawings for constructing boat storage facilities at the Slip 3 site at Waukegan Harbor, Illinois. We also briefly reviewed the following accompanying documents to understand the project and the site conditions:

- Specification Section 02621, *Geocomposite Drainage Layer*
- Specification Section 02700, *Polyethylene Geomembrane Liner*
- A technical memorandum (TM) entitled *Waukegan Harbor Slip 3 - Field Sampling Results* (dated June 22, 2007)

The following comments address only the aspects of the proposed work as they relate to the containment of the PCB-impacted sediments. The review does not offer any opinion as to the adequacy of the foundation or structural design concepts.

#### General Comments

1. The basic concepts presented in the drawings appear to be reasonable, assuming that the characterization of the contamination provided in the TM is accurate. We have very few comments on the submittal; most relate to the need to provide details such that the new 60-mil HDPE lining - together with the other structural elements such as the grade beams - will provide a continuous primary containment barrier. Specifically, the drawings provide no detail regarding attachment of the HDPE lining to the various penetrations under the building (e.g., monitoring well, piling, etc.). It is unclear how the HDPE lining will act as a continuous primary containment without such connections.
2. The concept presented in the *Basis of Design Memorandum, Alteration of Slip No. 3 Containment Cell, Outboard Marine Corporation Superfund Site* dated November 20, 2006 discussed roof downspout drains. In a comment on that document, it was asked if the downspout drains would be able to reach the peripheral drainage system with



adequate cover and still not extend into the contaminated sediments. The present drawings do not address roof drainage. How will it be managed to prevent infiltration into the containment cell?

### Specific Comments

1. **Sheet 4. Note 11.** This states that the topsoil and sand will be stockpiled at the City of Waukegan property location on Sheet 1. There is no proposed location identified on Sheet 1.
2. **Sheet 8.**
  - a. The area under the building is shaded and noted to be the "60-MIL HDPE LINER." Presumably the remainder of the area enclosed within the slurry walls and the cast sheet pile wall will also be provided with a 60-mil HDPE lining; the details on Sheet 13 imply this. This should be clarified.
  - b. Is there any slope the HDPE liner under the building? Where will drainage from the geocomposite drainage layer be discharged?
3. **Sheet 10. Detail 3. Note 6.** This states that the HDPE liner under the interior floor slab is not welded to the grade beam. It should be to provide a continuous primary lining.
4. **Sheet 11. Detail 7.** The lowered Well Vault (R-1) is not called out on Sheet 6. Should this be Detail 8 (on Sheet 7)? In addition, the liner to well vault penetration detail (Detail 17 on Sheet 13) should be called out to show how the HDPE will be connected to the vault to provide a continuous primary lining.
5. **Sheet 11. Detail 9.** How is the HDPE connected to the steel casing to provide a continuous primary lining?
6. **Sheet 11. Detail 10.** It is not clear where this detail applies. If within the building, how is the HDPE connected to the concrete to provide a continuous primary lining?
7. **Sheet 12. Detail 13.**
  - a. Special care will have to be taken to protect the HDPE liner from potential puncture damage where it crosses the slurry wall; the specifications should discuss removal of rocks or other objects as needed to protect the liner here.
  - b. In Section B, provide a boot-type penetration for both conduits (or some other method to provide a continuous primary lining).
  - c. In Section A and the plan view, the specifications should discuss how the 12-inch-diameter steel pipe is placed to minimize the potential for void formation in the slurry wall backfill. The seep collar is a good idea; the specifications should call for careful tamping of the backfill around the collar and beneath the pipe.
8. **Sheet 13. Detail 15.** The use of the Polylock strip is a convenient method to connect to the concrete, but has limited structural strength. Provision should be made to provide some amount of slack in the liner, or to otherwise accommodate potential differential settlement between the soil and the grade beam. The grade beams are pile-supported

and therefore unlikely to settle very much, while the fill is not pile-supported and may settle differentially relative to the grade beams.

9. **Sheet 13: Detail C.** HDPE is the least puncture-resistant of the commonly used geomembranes. A method to protect the HDPE liner from puncture where it is located above the protective concrete panels should be provided.

**Attachment C**

IEPA Comment Letter

Dated August 24, 2007

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## ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

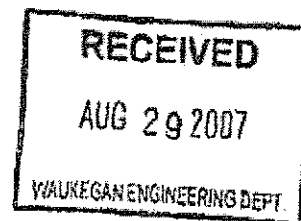
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 - (217) 782-3397  
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601 - (312) 814-6026

ROD R. BLAGOJEVICH, GOVERNOR

DOUGLAS P. SCOTT, DIRECTOR

August 24, 2007

Mr. John Moore, P.E., City Engineer  
Waukegan City Hall - Engineering Department  
100 North Martin Luther King Jr. Avenue  
Waukegan, Illinois 60085



Re: Alteration to Slip 3, Proposed Boat Storage Facility  
July 6 2007 Alteration Design  
OMC Superfund Site  
Waukegan, Illinois

Dear Mr. Moore,

The purpose of this letter is to transmit Illinois EPA's comments on the proposed alteration to Slip 3 of the OMC Superfund Site in Waukegan, Illinois to construct a boat storage facility to be used by Larsen Marino.

Slip 3 was constructed to provide a containment cell for TSCA level contaminated dredge sediment from the harbor in excess of 50 ppm and up to 500 ppm PCB. Therefore, the contaminated material below the surcharge sand should be handled, including proper worker PPE and exposure precautions, and disposed of in accordance with TSCA 40 CFR 761.

Although the limited sampling performed to determine whether the surcharge sand could be visually distinguished from the underlying contaminated sediment provided in this report shows no results above 50 ppm PCBs, a similar set of data collected in 2004 for a preliminary treatability screening shows 2 values above 50 ppm PCBs. It should be noted that PCB was the only parameter requested, PCB breakdown components, which have the potential to have their own toxic properties, were not.

It is possible that there are zones within Slip 3 that contain materials at or below 50 ppm PCB. When the harbor sediment was originally dredged to place into Slip 3, it is likely some over-dredging occurred that may have included material that tested below 50 ppm PCB, the use of surcharge sand may have had a similar effect, and, through time, there could be some breakdown of PCB. However, there is some data that indicates that there is still material within the containment cell at or above 50 ppm PCB. And, as the harbor was contaminated with sediment containing from 50 to 500 ppm and above PCB, it is possible there are zones containing materials that are closer to the higher limit.

ROCKFORD - 4302 North Main Street, Rockford, IL 61103 - (815) 987-7760 • DES PLAINES - 9511 W. Harrison St., Des Plaines, IL 60016 - (847) 294-4000  
ELGIN - 595 South State, Elgin, IL 60123 - (847) 608-3131 • PEORIA - 5415 N. University St., Peoria, IL 61614 - (309) 693-5462  
BUREAU OF LAND - PEORIA - 7650 N. University St., Peoria, IL 61614 - (309) 693-5462 • CHAMPAIGN - 2123 South First Street, Champaign, IL 61820 - (217) 278-5600  
SPRINGFIELD - 4500 S. Sixth Street Rd., Springfield, IL 62706 - (217) 786-0892 • COLLINGSVILLE - 2009 Main Street, Collinsville, IL 62234 - (618) 346-5120  
MARIION - 2104 W. Main St., Suite 116, Marion, IL 62959 - (618) 992-7200

Received Time Sep. 12, 2007 9:14AM No. 0183 PRINTED ON RECYCLED PAPER

Since the exposure to contaminated materials within Slip 3 will be limited and no excavation is planned below the surcharge sand, the costs to handle and dispose of this material in accordance with TSCA regulations should not significantly affect the total costs of this project.

If there are any questions concerning this letter, please do not hesitate to contact me at 217-785-8725.

Sincerely,

*Erin J. Rednour*

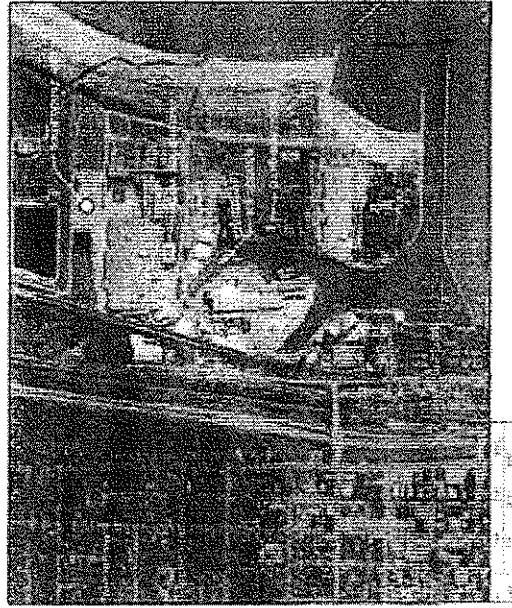
Erin Rednour, Project Manager  
Illinois Environmental Protection Agency  
Bureau of Land  
1021 North Grand Avenue East  
P.O. Box 19276  
Springfield, Illinois 62794-9276

## **Attachment D**

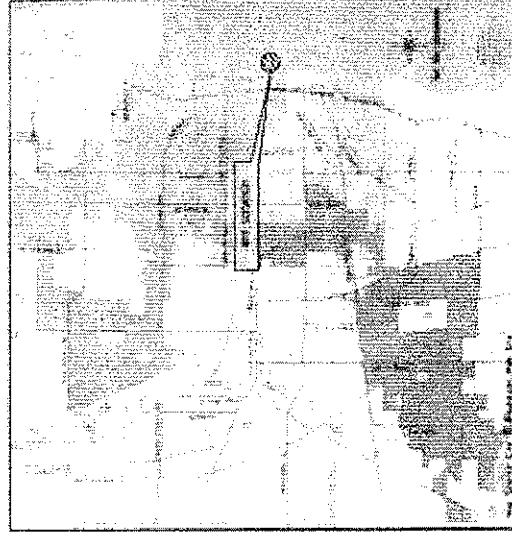
Containment Alteration/Boat Storage  
Re-Use Waukegan Harbor Slip 3 Site

# CITY OF WAUKEGAN CONTAINMENT ALTERATION / BOAT STORAGE RE-USE WAUKEGAN HARBOR SLIP 3 SITE

100% DESIGN SUBMITTAL  
OCTOBER 2007



PROJECT AERIAL MAP



SITE LOCATION MAP

## DRAWING INDEX

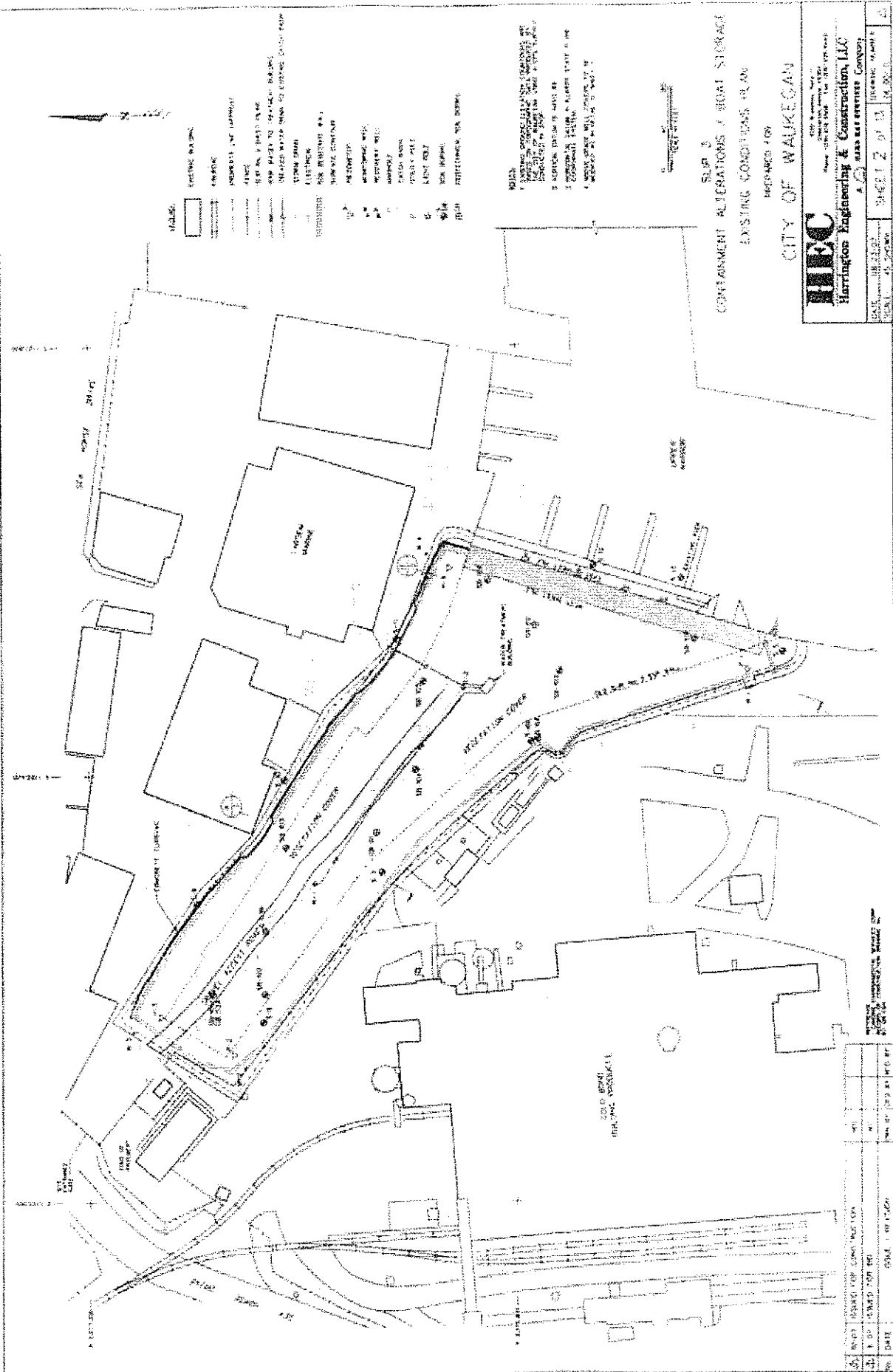
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- 2 EXISTING CONDITIONS PLAN
- 3 EXISTING CONDITIONS CROSS SECTIONS
- 4 EXCAVATION PLAN
- 5 EXCAVATION CROSS SECTIONS
- 6 FOUNDATIONSLAB PLAN AND ALL PIE LOCATIONS
- 7 MECHANICAL AND ELECTRICAL PLAN
- 8 TOP OF LINER PLAN
- 9 FINISHED SURFACE PLAN
- 10 DETAILS 1 TO 7
- 11 DETAILS 8 TO 12
- 12 DETAILS 13 & 14
- 13 DETAILS 15 TO 18, A, B, C, & D

SLIP 3  
CONTAINMENT ALTERATION / BOAT STORAGE  
COVER SHEET  
DEPARTMENT OF  
CITY OF WAUKEGAN

**HEC**

Harrington Engineering & Construction, LLC  
A PROFESSIONAL CORPORATION  
1000 N. Waukegan Road, Suite 100  
Waukegan, IL 60085  
Phone: 847.933.1000  
Fax: 847.933.1001  
www.hecinc.com

DATE: 10/23/07	SHEET: 1 OF 13	PROJECT: Waukegan Harbor Slip 3
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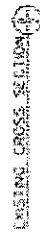
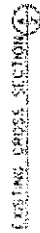
SHEET 2 OF 3  
 PREPARED FOR  
 CITY OF WAUKESHA  
 CONTAINMENT ALTERATIONS / BOAT STORAGE  
 EXISTING CONDITIONS PLAN

**HBC**  
Harrington Engineering & Construction, LLC

1000 E. Main Street  
Waukesha, WI 53181  
Phone: (262) 533-1000 Fax: (262) 533-1001

DATE: 08/21/2008  
SCALE: AS SHOWN  
SHEET 2 OF 3  
DRAWING NAME: CONTAINMENT ALTERATIONS / BOAT STORAGE EXISTING CONDITIONS PLAN





City of Wake County



**Harrington Engineering & Construction, LLC**

此項報告係由本局委託  
 財政部調查局調查

11/15/2015 11:15 AM

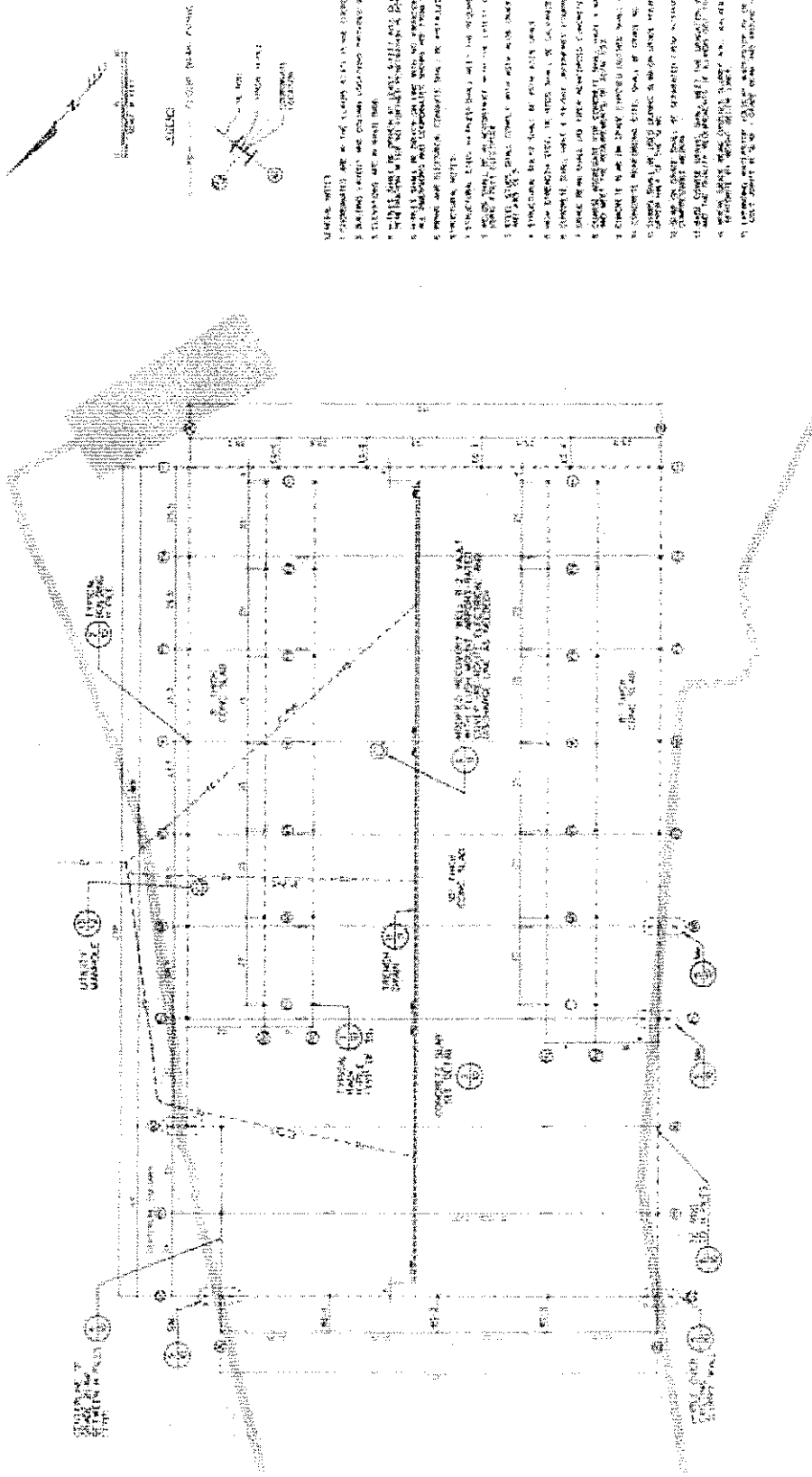
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# CONTAMINANT ALLEGATIONS - BOAT STORAGE FOUNDATION / BOAT PLAN AND PHOTOCOPY LOCATIONS

PREPARED BY

CITY OF WAIKANA



Harrington Engineering & Construction, Inc.  
A 100% ALLIANCE COMPANY

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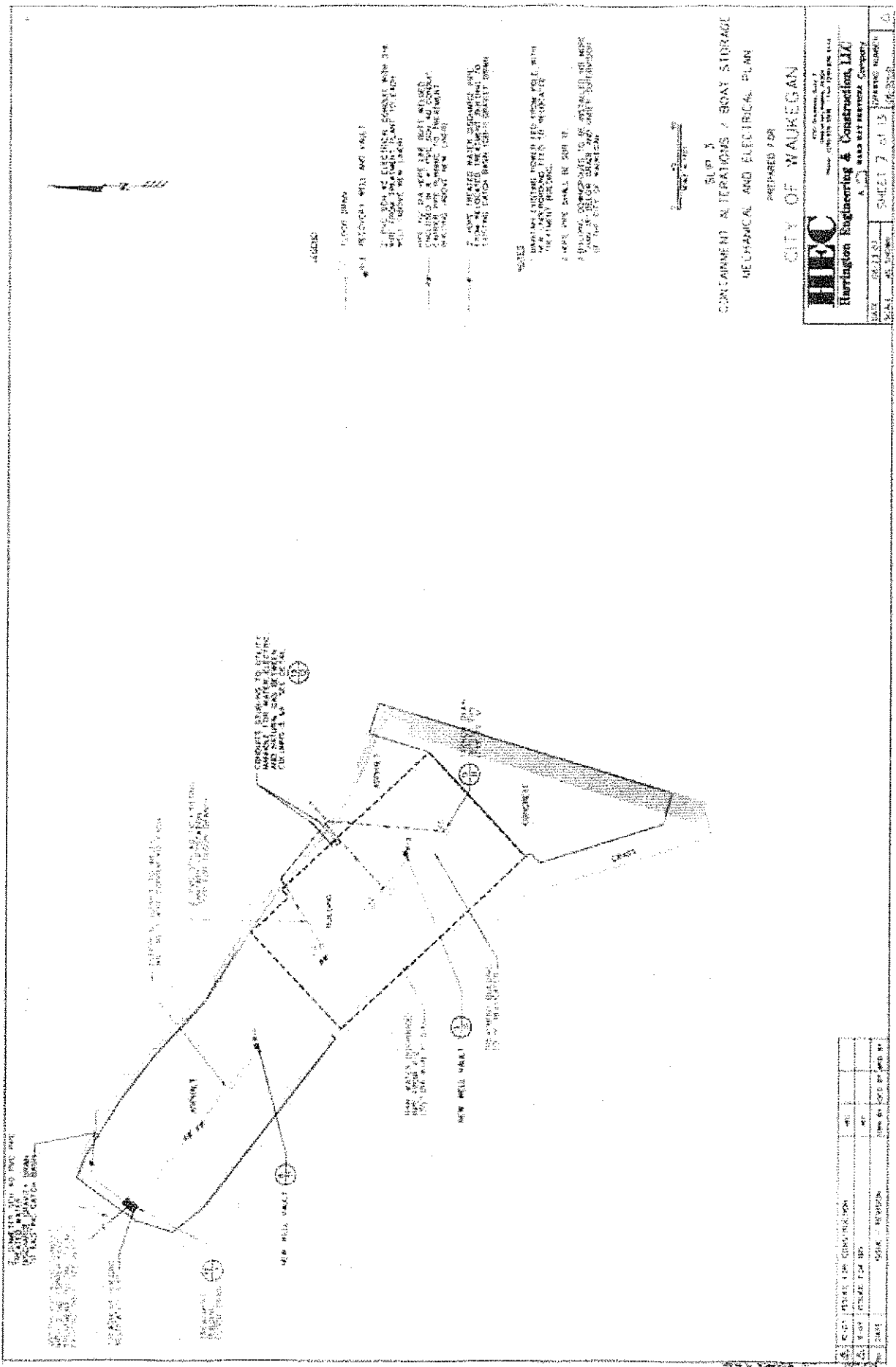
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**HREC**

Harrington Engineering & Construction, LLC

1000 Lakeside Drive, Suite 100  
Waukesha, WI 53186  
Phone: 262.533.1100  
Fax: 262.533.1101  
www.hrec.com

DATE: 08/13/10  
SCALE: AS SHOWN  
SHEET 7 OF 13  
PROJECT: CONTAINER ALTERATIONS / BOX STORAGE

CONTAINER ALTERATIONS / BOX STORAGE  
MECHANICAL AND ELECTRICAL PLAN  
PREPARED FOR:  
CITY OF WAUKESHA

LEGEND

--- FLOOR DRUM

--- NEW ELECTRICAL WIRING

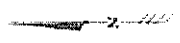
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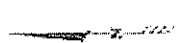
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CITY OF WAKEFELD

	<b>Harrington Engineering &amp; Construction, LLC</b> A CARR-SAY SERVICES COMPANY	
10000 Riverchase, Suite 2 Houston, Texas 77036 Phone: (713) 466-1000 Fax: (713) 466-1001	PROJECT NO. 11 SHEET 78 OF 11	DRAWING NUMBER 10-00-01
DATE: 08-21-00 SCALE: AS SHOWN		

姓名	性别	年龄	职业	住址
王德胜	男	45	工人	上海市静安区南京西路100号
李秀英	女	38	教师	上海市浦东新区川沙路200号
张国强	男	52	医生	上海市徐汇区淮海中路150号
赵美华	女	28	学生	上海市虹口区四川北路300号
孙志明	男	60	退休	上海市黄浦区南京东路120号
周丽娟	女	42	护士	上海市杨浦区四平路180号
吴大伟	男	35	工程师	上海市嘉定区嘉定镇100号
陈小红	女	25	职员	上海市宝山区淞滨路150号
林国强	男	55	农民	上海市崇明县陈家镇100号
徐美玲	女	30	会计	上海市金山区枫泾镇150号
王德胜	男	45	工人	上海市静安区南京西路100号



2017-2018

CITY OF WASHINGTON



# IT'S A WONDERFUL WORLD OUT THERE

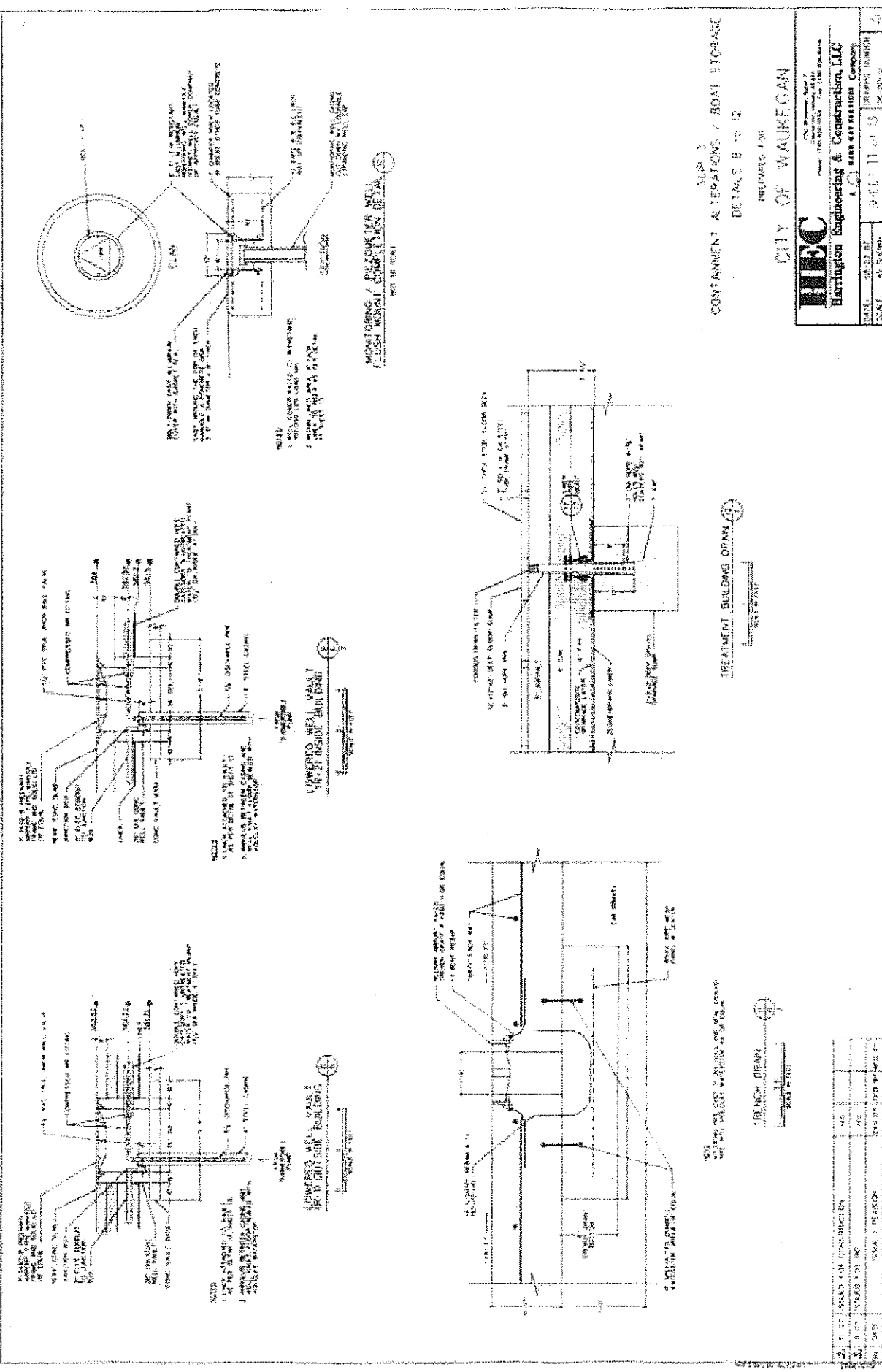
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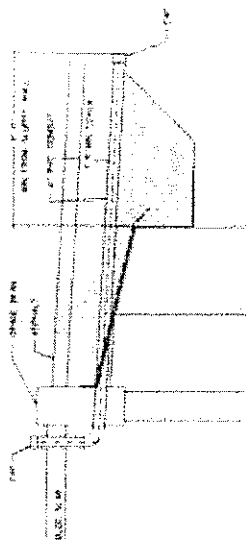
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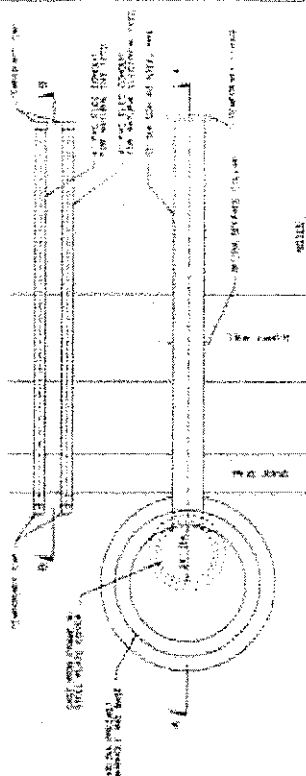




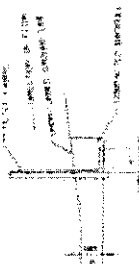




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$\mathcal{H}^1(\mathbb{R}^n) \cap \mathcal{H}^1(\mathbb{R}^n) = \mathcal{H}^1(\mathbb{R}^n)$

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